STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
FRED G. STEVENOT, Director

DIVISION OF MINES AND MINING

FERRY BUILDING, SAN FRANCISCO

WALTER W. BRADLEY — State Mineralogist

San Francisco] BULLETIN No. 101 [September, 1928

CALIFORNIA MINERAL PRODUCTION FOR 1927

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By
HENRY H. SYMONS

2279

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LETTER OF TRANSMITTAL.

September, 1928.

To His Excellency, The Honorable C. C. Young,
Governor of the State of California.

Sir: I have the honor to herewith transmit Bulletin No. 101 of the State Division of Mines and Mining, being the annual report of the statistics of the mineral production of California.

The remarkable variety, total valuation, and wide distribution of many of our minerals revealed herein show California's importance as a producer of commercial minerals among the states of the Union.

Respectfully submitted.

Walter W. Bradley,
State Mineralogist.

INTRODUCTION

It is the endeavor of the staff of the State Mining Bureau (now Division of Mines and Mining of the State Department of Natural Resources), in these annual reports of the mineral industries of California, to so compile the statistics of production that they will be of actual use to producers and to those interested in the utilization of the mineral products of our state, while at the same time keeping the individual's data confidential. In addition to the mere figures of output, we have included descriptions of the uses and characteristics of many of the materials, as well as a brief mention of their occurrences.

The compilation of accurate and dependable figures is an extremely difficult undertaking, and the State Mineralogist takes the opportunity of here expressing his appreciation of the cooperation of the producers in making this work possible. A fuller appreciation of the value of early responses to the requests sent out in January will result in earlier completion of the manuscript. Statistics lose much of their value if their publication is unnecessarily delayed.

Some of the data relative to properties and uses of many of the minerals herein described are repeated from preceding reports, as it is intended that this annual statistical bulletin shall be somewhat of a compendium of information on California's commercial minerals and their utilization.

WALTER W. BRADLEY,
State Mineralogist.

MINERAL INDUSTRY, CALIFORNIA, 1927

DATA COMPILED FROM DIRECT RETURNS FROM PRODUCERS IN ANSWER TO INQUIRIES SENT OUT BY THE CALIFORNIA STATE DIVISION OF MINES AND MINING, FERRY BUILDING, SAN FRANCISCO, CALIFORNIA

CHAPTER ONE

The total value of the mineral output of California for the year 1927 was $366,781,394, being a decrease of $83,549,462 under the 1926 total of $450,330,856. There were fifty-eight different mineral substances, exclusive of a segregation of the various stones grouped under gems; and all of the fifty-eight counties of the state contributed to the list.

As revealed by the data following, the salient features of 1927 compared with the preceding year were: A large drop in the value of petroleum in an amount greater than the net decrease in the grand total for all substances, being only partly offset by increases in other items. Material advances were made by borates, cement, potash, natural gas, granite, limestone, quicksilver, sandstone, and soda. Decreases were registered by copper, zinc, miscellaneous stone, brick, lead, salt, and silver. Petroleum showed a decrease in value of $84,811,179, although there was an increase from 224,637,281 barrels to 231,195,774 barrels. This was due to a sharp cut in the price of crude oil, mainly for grades over 20° Baumé, effective April 16, 1927. There were a number of other minor variations, the result being a decrease in the totals of the fuels and metals groups, while all other groups showed increases.

Of the metals, titanium was added to the list, being the first year of any record of its production in commercial quantity in California; quicksilver increased from 5892 flasks worth $516,382 to 6488 flasks worth $714,418, this being accounted for by the advanced price received by the producers. In 1926 they received $87.64 and in 1927, $116.94 per 75-pound flask. Copper decreased from 33,521,544 pounds worth $4,693,014 to 27,350,316 pounds worth $3,582,885; gold from $11,923,481 to $11,671,018; lead from 8,067,873 pounds worth $645,429 to 2,748,440 pounds worth $173,151; silver from 2,022,460 fine ounces worth $1,262,015 to 1,620,242 fine ounces worth $918,677; and zinc from 20,447,559 pounds worth $1,533,568 to 8,625,004 pounds worth $552,000. The decrease in copper, lead and zinc was due to a drop in the market prices, while the gold and silver, by-products of these ores, account for the decreases in the total gold and silver figures. Though

the gold yield decreased in value, California continues in the lead, and in 1927 accounted for approximately 26 per cent of the gold output of the United States.

Of the structural group: Cement advanced from 13,797,173 barrels valued at $25,269,678 to 14,661,783 barrels at $26,474,935, though the average price per barrel dropped from $1.84 to $1.80; granite increased in value from $655,332 to $1,398,443, and sandstone from $17,500 to $205,400; brick and hollow building tile dropped from a valuation of $7,026,124 to $6,516,077, and miscellaneous stone from $19,859,873 to $18,912,994; of the remaining minerals in this group there were no material changes. Of the industrial minerals there were a number of fluctuations with a general trend of increasing production and value. The important changes were: pottery clay with an increase from 797,461 tons valued at $806,509 to 867,419 tons and $872,661; limestone from 108,795 tons valued at $367,501 to 899,790 tons and $663,957. Of the saline group, borates showed an increase from 47,605 tons valued at $1,625,298 to 72,462 tons at $3,043,260; potash, 32,884 tons valued at $812,285 to 67,340 tons and $1,952,852; and salt showed a decrease from 311,761 tons valued at $1,124,978 to 263,028 tons and $639,127.

The figures of the State Division of Mines and Mining are made up from reports received direct from the producers of the various minerals. Care is exercised in avoiding duplication, and any error is likely to be on the side of under- rather than over-estimation.

California yields, commercially, a greater number and variety of mineral products than any state in the United States, and probably more than any other equal area elsewhere on the earth. The total annual value of her output has been surpassed by not more than four or five others, and those usually the great coal states of east of the Mississippi. More recently California has been placed second to Pennsylvania, the leader. California was for many years the sole domestic source of borax, chromite and magnesite, and in which we still lead. We lead all other states in the production of gold, quicksilver, and platinum; and have alternated in the lead with Colorado in tungsten, and with Oklahoma in petroleum.

The mineral industries, not only in California, but throughout the country, have reached quite a different phase from that of the old gold-rush days more than fifty years ago. A broader and more intimate status has been attained, touching practically every avenue of domestic and commercial endeavor. As quoted in a former report[1] of the freight handled by the railroads of the country, the products of the mines represent 51.33 per cent. While gold, in which California still leads the United States, is still important, other metals and even nonmetals have superseded it in annual value. The greatest commercial developments proportionately in California in recent years have taken place among the industrial and structural minerals, not to mention petroleum, which leads all others in value. This introduces a new factor which requires study and attention—that of marketing. The gold miner could, and still does, take his metal to the mint and receives

[1] Cal. State Min. Bur., Bulletin 96, p. 12, 1925.

its equivalent in the 'coin of the realm'; and he knows from day to day and year to year, without variation, just how much each ounce of gold will bring in that coin, though its equivalent in other commodities varies according to economic conditions. Marketing and competition, however, are vital factors in the industrial and structural groups.

By Substances.

The following table shows the comparative yield of mineral substances of California for 1926 and 1927, as compiled from the returns received at the State Division of Mines and Mining, San Francisco, in answer to inquiries sent to producers:

Substance	1926 Amount	1926 Value	1927 Amount	1927 Value	Increase+ Decrease— Value
Barytes	4,978 tons	$38,165	17,993 tons	$90,617	$52,452+
Bituminous rock	3,863 tons	21,577	3,515 tons	17,704	3,873—
Borates	47,605 tons	1,625,298	72,462 tons	3,043,260	1,417,962+
Brick and hollow building tile	-----	7,026,124	-----	6,516,077	510,047—
Cement	13,797,173 bbls.	25,269,678	14,661,783 bbls.	26,474,935	1,205,257+
Chromite	395 tons	7,063	225 tons	5,063	2,000—
Clay (pottery)	797,461 tons	806,509	867,419 tons	872,661	66,152+
Coal	1,100 tons	5,000	*	*	* —
Copper	33,521,544 lbs.	4,693,014	27,350,316 lbs.	3,582,885	1,110,129—
Dolomite	68,640 tons	119,313	45,976 tons	79,422	39,891—
Feldspar	7,300 tons	56,400	10,932 tons	86,101	29,701+
Fuller's earth	23,552 tons	250,192	13,018 tons	154,764	95,428—
Gems	-----	9,049	-----	7,035	2,014—
Gold	-----	11,923,481	-----	11,671,018	252,463—
Granite	-----	655,332	-----	1,398,443	743,111+
Gypsum	114,868 tons	211,337	94,630 tons	292,090	80,753+
Lead	8,067,873 lbs.	645,429	2,748,440 lbs.	173,151	472,278—
Lime	63,568 tons	670,837	60,498 tons	631,497	39,340—
Limestone	108,795 tons	367,501	699,790 tons	663,957	296,456+
Magnesite	50,915 tons	587,642	46,093 tons	577,887	9,755—
Magnesium salts	4,881 tons	124,470	*	*	* —
Manganese ore	235 tons	4,700	-----	-----	4,700—
Marble	34,806 cu. ft.	119,999	[a] 42,308 cu. ft.	103,689	16,310—
Mineral paint	569 tons	5,846	*	*	* —
Mineral water	14,074,877 gals.	1,171,550	16,624,423 gals.	1,487,183	315,633+
Natural gas	214,549,477 M cu. ft.	19,465,347	224,686,940 M cu. ft.	20,447,294	981,947+
Onyx and travertine	15,090 cu. ft.	7,575	[b]	[b]	[b] +
Petroleum	224,673,281 bbls.	345,546,677	231,195,774 bbls.	260,735,498	84,811,179—
Platinum	306 fine oz.	32,005	139 fine oz.	10,749	21,256—
Potash	32,884 tons	812,285	67,340 tons	1,952,852	1,140,567+
Pumice and volcanic ash	7,170 tons	48,350	13,779 tons	168,896	120,546+
Pyrite	100,896 tons	466,088	130,910 tons	564,823	98,735+
Quicksilver	5,892 flasks	516,382	6,488 flasks	714,418	198,036+
Salt	311,761 tons	1,124,978	263,028 tons	639,127	485,851—
Sandstone	34,100 cu. ft.	17,500	22,900 cu. ft.	205,400	187,900+
Silica (sand and quartz)	30,010 tons	104,317	24,636 tons	94,762	9,555—
Silver	2,022,460 fine oz.	1,262,015	1,620,242 fine oz.	918,677	343,338—
Slate	-----	7,371	-----	17,960	10,589+
Soapstone and talc	17,004 tons	255,645	16,218 tons	164,744	90,901—
Soda	63,333 tons	1,305,802	62,571 tons	1,478,239	172,437+

Stone, miscellaneous	[c] -----	19,859,873	-----	18,912,994	946,879—
Tungsten	441 tons	316,560	*	*	* —
Zinc	20,447,559 lbs.	1,533,568	8,625,004 lbs.	552,000	981,568—
Unapportioned	------	[d] 1,233,012	-----	[e] 1,273,522	40,510+
Total values		$450,330,856		$366,781,394	
Net decrease					$83,549,462—

* Included under 'Unapportioned.'

[a] Includes onyx and travertine.

[b] Combined with marble.

[c] Includes macadam, ballast, rubble, riprap, sand and gravel, paving blocks, and grinding mill pebbles.

[d] Includes antimony, asbestos, bromine, calcium chloride, diatomaceous earth, iron ore, lithia, shale oil, sillimanite-andalusite-cyanite group.

[e] Includes antimony, asbestos, bromine, coal, graphite, diatomaceous earth, heptane, iron ore, lithia, magnesium salts, mineral paint, shale-oil, sillimanite-andalusite-cyanite group, slate, titanium and tungsten.

By Counties.

The following table shows the comparative value of the mineral production of the various counties in the state for the years 1926 and 1927:

	1926	*1927*
Alameda	$3,158,474	$2,577,787
Alpine	450	5,306
Amador	2,451,500	2,207,798
Butte	461,945	308,139
Calaveras	1,809,772	1,608,714
Colusa	91,194	13,207
Contra Costa	2,610,553	2,172,756
Del Norte	70,464	53,975
El Dorado	302,086	245,435
Fresno	6,699,928	7,547,216
Glenn	58,391	63,869
Humboldt	706,670	562,802
Imperial	467,314	350,977
Inyo	2,835,834	2,519,834
Kern	83,556,074	64,729,488
Kings	720	1,599
Lake	75,693	85,048
Lassen	19,063	49,425
Los Angeles	194,358,926	131,832,441
Madera	425,738	1,059,666
Marin	527,553	527,004
Mariposa	319,724	499,878
Mendocino	15,800	47,670
Merced	192,665	366,873
Modoc	37,991	62,251
Mono	209,848	102,187
Monterey	359,993	351,049
Napa	341,571	417,229
Nevada	3,240,211	2,213,709
Orange	63,223,082	60,547,041
Placer	480,882	360,224
Plumas	3,572,628	3,260,723
Riverside	6,194,253	6,543,369
Sacramento	2,243,952	2,348,916
San Benito	2,400,850	1,901,854
San Bernardino	14,218,475	16,140,703
San Diego	1,241,324	1,619,431
San Francisco	112,193	62,700
San Joaquin	842,000	711,965
San Luis Obispo	253,294	295,030
San Mateo	1,893,853	1,863,838
Santa Barbara	2,583,548	2,699,296
Santa Clara	1,028,506	990,876
Santa Cruz	3,504,194	3,473,209
Shasta	2,886,144	1,950,088
Sierra	569,515	752,533
Siskiyou	494,151	298,946
Solano	1,770,820	1,557,840
Sonoma	222,586	265,392
Stanislaus	401,997	393,089
Sutter	397	300
Tehama	10,340	5,350
Trinity	611,797	555,854
Tulare	397,920	474,173
Tuolumne	615,998	432,416
Ventura	30,208,369	30,995,379
Yolo	20,560	17,895
Yuba	2,921,083	3,679,632
Totals	$450,330,856	$366,781,394

Total Mineral Production of California, by Years.

The following tabulation gives the total value of mineral production of California by years since 1887, in which year compilation of such data by the State Mining Bureau (now Division of Mines and Mining) began. At the side of these figures the writer has placed the values of the most important metal and non-metal items—gold and petroleum.

In the same period copper made an important growth beginning with 1897 following the entry of the Shasta County mines, and more recently Plumas County. Cement increased rapidly from 1902, while crushed rock, sand and gravel as a group parallels the cement increase. Quicksilver has been up and down. Mineral water and salt have always been important items, but the values fluctuate. Borax has increased materially since 1896. War-time increases, 1915–1918, were shown by chromite, copper, lead, magnesite, manganese, silver, tungsten and zinc. Most of these, except silver, have since declined, though structural materials and copper increased in 1920–1924, also lead and magnesite in 1923; lead and zinc in 1925; zinc in 1926, with silver declining; an increase in quicksilver in 1927, with a decline in all other metals.

Total Mineral Production of California, by Years, Since 1887.

Year	Total value of all minerals	Gold, value	Petroleum, value
1887	$19,785,868	$13,588,614	$1,357,144
1888	19,469,320	12,750,000	1,380,666
1889	16,681,731	11,212,913	368,048
1890	18,039,666	12,309,793	384,200
1891	18,872,413	12,728,869	401,264
1892	18,300,168	12,571,900	561,333
1893	18,811,261	12,422,811	608,092
1894	20,203,294	13,923,281	1,064,521
1895	22,844,663	15,334,317	1,000,235
1896	24,291,398	17,181,562	1,180,793
1897	25,142,441	15,871,401	1,918,269
1898	27,289,079	15,906,478	2,376,420
1899	29,313,460	15,336,031	2,660,793
1900	32,622,945	15,863,355	4,152,928
1901	34,355,981	16,989,044	2,961,102
1902	35,069,105	16,910,320	4,692,189
1903	37,759,040	16,471,264	7,313,271
1904	43,778,348	19,109,600	8,317,809
1905	43,069,227	19,197,043	9,007,820
1906	46,776,085	18,732,452	9,238,020
1907	55,697,949	16,727,928	16,783,943
1908	66,363,198	18,761,559	26,566,181
1909	82,972,209	20,237,870	32,398,187
1910	88,419,079	19,715,440	37,689,542
1911	87,497,879	19,738,908	40,552,088
1912	88,972,385	19,713,478	41,868,344
1913	98,644,639	20,406,958	48,578,014
1914	93,314,773	20,653,496	47,487,109
1915	96,663,369	22,442,296	43,503,837
1916	127,901,610	21,410,741	57,421,334
1917	161,202,962	20,087,504	86,976,209
1918	199,753,837	16,529,162	127,459,221
1919	195,830,002	16,695,955	142,610,563
1920	242,099,667	14,311,043	178,394,937
1921	268,157,472	15,704,822	203,138,225
1922	245,183,826	14,670,346	173,381,265
1923	344,024,678	13,379,013	242,731,309
1924	374,620,789	13,150,175	274,652,874
1925	434,519,660	13,065,330	330,609,829
1926	450,330,856	11,923,481	345,546,677
1927	366,781,394	11,671,018	260,735,498
Totals	$4,722,027,726	$665,407,571	$2,820,030,103

CHAPTER TWO

FUELS (Hydrocarbons)

Among the most important mineral products of California are its fuels. This subdivision includes coal, natural gas, and petroleum, the combined values of which made up practically 77 per cent of the state's entire mineral output for the year 1927.

There are deposits of peat known in several localities in California, small amounts of which are used as a fertilizer, and in stock-food preparations, but none has yet been recorded as utilized for fuel.

Comparison of values during 1926 and 1927 is shown in the following table:

Substance	*1926*		*1927*		*Increase+ Decrease— Value*
	Amount	*Value*	*Amount*	*Value*	
Coal	1,100 tons	$5,000	-----	-----	-----—
Natural gas	214,549,477 M cu. ft.	19,465,347	244,686,940 M cu. ft.	$20,447,294	$981,947+
Petroleum	224,673,281 bbls.	345,546,677	231,195,774 bbls.	260,735,498	84,811,179—
Unapportioned	-----	-----	-----	[a] 5,100	-----
Total value		$365,017,024		$281,187,892	
Net decrease					$83,829,132—

[a] Includes coal and heptane.

COAL

Bibliography: State Mineralogist Reports VII, XII–XV (inc.), XVII, XIX–XXI (inc.). U. S. Geol. Surv., Bulletins 285, 316, 431, 471, 581; Ann. Rept. 22, Pt. III.

The coal production in California for 1927 was limited to Amador County. This was consumed by a local market and also on the property for camp purposes, power and forge, to carry on regular operation and development work.

Total Coal Production of California.

The very considerable output of coal in the years previous to 1883 was almost entirely from the Mount Diablo district, Contra Costa County. Later the Tesla mine in Corral Hollow, Alameda County, was an important producer for a few years. Stone Canyon, Monterey County, was also an important producer for a short time, and there has been some coal shipped from properties in Amador, Fresno, Orange, Riverside and Siskiyou counties. The following tabulation gives the annual tonnages and values, according to available records:

Coal Output and Value by Years.

Year	Tons	Value	Year	Tons	Value
1861	6,620	$38,065	1896	70,649	$161,335
1862	23,400	134,550	1897	87,449	196,255
1863	43,200	248,400	1898	143,045	337,475
1864	50,700	291,525	1899	160,941	420,109
1865	60,530	348,048	1900	176,956	535,531
1866	84,020	483,115	1901	150,724	401,772
1867	124,690	716,968	1902	88,460	248,622
1868	143,676	826,137	1903	93,026	265,383
1869	157,234	904,096	1904	79,062	376,494
1870	141,890	815,868	1905	46,500	144,500
1871	152,493	876,835	1906	24,850	61,600
1872	190,859	1,097,439	1907	23,734	55,849
1873	186,611	1,073,013	1908	18,496	55,503
1874	215,352	1,238,274	1909	49,389	216,913
1875	166,638	958,169	1910	11,033	23,484
1876	128,049	736,282	1911	11,047	18,297
1877	107,789	619,787	1912	14,484	39,092
1878	134,237	771,863	1913	25,198	85,809
1879	147,879	850,304	1914	11,859	28,806
1880	236,950	1,362,463	1915	10,299	26,662
1881	140,000	805,000	1916	4,037	7,030
1882	112,592	647,404	1917	3,527	7,691
1883	76,162	380,810	1918	6,343	16,149
1884	77,485	309,950	1919	2,983	8,203
1885	71,615	286,460	1920	2,078	5,450
1886	100,000	300,000	1921	12,467	63,578
1887	50,000	150,000	1922	27,020	135,100
1888	95,000	380,000	1923	1,010	5,090
1889	121,280	288,232	1924	1,425	8,800
1890	110,711	283,019	1925	730	3,880
1891	93,301	204,902	1926	1,100	5,000
1892	85,178	209,711	1927	*	
1893	72,603	167,555			
1894	59,887	139,862	Totals	5,208,410	$23,103,358
1895	79,858	193,790			

* Under 'Unapportioned.'

The tonnages in the above table for the years 1861–1886 (incl.) are taken from the U. S. Geological Survey, "Mineral Resources of the U. S., 1910," p. 107. The values assigned for the years previous to 1883 are those given by W. A. Goodyear (Mineral Res., 1882, pp. 93–94), being an average of $5.75 per ton. From 1887 to date the figures are those of the California State Mining Bureau.

HEPTANE

Heptane was added to the list of hydrocarbons this year. There was a production reported as a by-product of bromine recovery from bittern water of San Diego County.

Heptane is used as a solvent of alkalies in vegetable oils, an antiseptic, a starter for other organic compounds, and as an ideal fuel. The reason for its value in these uses is its definite chemical composition and its boiling point at 98° C., just under the boiling point of water.

NATURAL GAS

Bibliography: State Mineralogist Reports VII, X, XII, XIII, XIV. Bulletins 3, 16, 19, 69, 73, 89. Monthly Summary, Oil & Gas Supervisor, Dec., 1919; Aug., 1922; Mar., 1923; Mar. and Apr., 1926.

Statistics on the production of natural gas in California are in a considerable degree difficult to arrive at, as much of it that is utilized directly at the wells for heating, lighting, and driving gas engines is not measured. Hence, it is necessary to approximate the output of many of the operators in the oil fields, estimated on the number of lights, and on the number and horsepower of gas engines and steam boilers thus operated. The figures here given are for gas utilized locally and also that sold for distribution to consumers; and we consider are not over-estimated, particularly in the six oil-producing counties. It must be remembered that some of our important oil fields are removed many miles from the site of any other industry, and that the gathering of small amounts of gas and transporting it for any considerable distance may not always be profitable, nor is it often possible to have pipe-line facilities available to handle the gas accompanying the early gas production in newly developed fields. Wherever feasible, casing-head gas is used in driving gas engines for pumping and drilling, and in firing the boilers of steam-driven plants.

The most notable gas developments in California have been in the Elk Hills and Buena Vista Hills in Kern County, northeast of the Midway district; in the oil fields in the Los Angeles basin, Los Angeles and Orange counties; and more recently in Ventura County.

Production and Value.

There is rather a wide variation in prices quoted for natural gas because a considerable part is used directly in the field for driving gas engines and firing boilers, and is therefore not measured nor sold. Such companies as have placed a valuation on the gas that was thus used in 1927 gave from 3¢ to 25¢ per 1000 cu. ft., at the well. From the totals shown in the tabulation following herein, the average value for all fields in 1927 works out at approximately 9.1¢. Approximately 7000 cu. ft. of gas is equal to one barrel of oil in heating value, and is so accounted for by many operators. In driving gas engines, about 4000 cu. ft. per 24 hr. are consumed by a 25-h.p. engine, and 63,700 cu. ft. per day for heating a 70-h.p. steam boiler, which figures have been utilized in compiling this report, in those cases where gas was not metered.

Natural Gas 'Consumed,' or Utilized for Fuel, 1927

County	*M cu. ft.*	*Value*
Fresno	1,682,652	$148,227
Kern	39,401,428	2,057,807
Kings	420	220
Lake	440	220
Los Angeles	59,749,559	7,117,081
Orange	50,981,982	3,910,501
Santa Barbara	1,701,715	204,775
Ventura	71,036,201	6,951,273
Butte, Humboldt, Mendocino, Sacramento and San Mateo*	132,538	57,190
Totals	224,686,940	$20,447,294

* Combined to conceal output of a single operator in each.

The above totals for 1927 compare with 214,549,477 M cu. ft. valued at $19,465,347 in 1926. Important increases in quantity in 1927 were made by Ventura County, which showed 71,036,201 M cu. ft. worth $6,951,273, compared with 41,559,144 M cu. ft. worth $4,080,040 in 1926, and Orange County, with 50,981,982 M cu. ft. worth $3,910,501, compared with 33,276,379 M cu. ft. worth $3,556,194 in 1926. Fresno, Kern, Los Angeles and Santa Barbara counties utilized somewhat smaller quantities of natural gas, but there was a larger quantity of natural gas gasoline treated.

Natural Gas Production in California, Since 1888.

The production of natural gas in California by years since 1888 is given in the following table. The first economic use of natural gas in California was from the famous Court House well at Stockton, bored in 1854–1858. Beginning about 1883 and for several succeeding years, a number of gas wells were brought in around Stockton. Natural gas was known in a number of other localities, and occasionally utilized in a small way, notably at Kelseyville in Lake County, and in Humboldt County near Petrolia and Eureka, but there are no available authentic records of amounts or values previous to the year 1888. The most important developments in the commercial production of natural gas have been coincident with developments in the oil fields, by utilizing the casing-head gas as well as that from dry-gas wells.

Year	M cubic feet	Value	Year	M cubic feet	Value
1888	[a]12,000	$10,000	1909	1,148,467	$616,932
1889	[a]14,500	12,680	1910	10,579,933	1,676,367
1890	[a]41,250	33,000	1911	[a]5,000,000	491,859
1891	[a]39,000	30,000	1912	[a]12,600,000	940,076
1892	[a]75,000	55,000	1913	14,210,836	1,053,292
1893	[a]84,000	68,500	1914	16,529,963	1,049,470
1894	[a b]85,080	79,072	1915	21,992,892	1,706,480
1895	[a b]110,800	112,000	1916	28,134,365	2,871,751
1896	[a b]131,100	111,457	1917	44,343,020	2,964,922
1897	[a]71,300	62,657	1918	46,373,052	3,289,524
1898	[a]111,165	74,424	1919	52,173,503	4,041,217
1899	115,110	95,000	1920	58,567,772	3,898,286
1900	40,566	34,578	1921	67,043,797	4,704,678
1901	120,800	92,034	1922	103,628,027	6,990,030
1902	120,968	99,443	1923	240,405,397	15,661,433
1903	120,134	75,237	1924	209,021,596	15,153,140
1904	144,437	91,035	1925	194,719,924	15,890 082
1905	148,345	102,479	1926	214,549,477	19,465,347
1906	168,175	109,489	1927	224,668,940	20,447,294
1907	169,991	114,759			
1908	842,883	474,584	Totals	1,569,357,565	$124,849,608

[a] Quantity, in part, estimated, where values only were reported.
[b] Includes natural CO_2 from a mine in Santa Clara County.

Gasoline from Natural Gas.

More or less gas usually accompanies the petroleum in the oil fields, and such gas carries varying amounts of gasoline. A total of 142 plants were in operation in 1927 recovering gasoline by compression or absorption from this 'casing-head' gas. After the gasoline is extracted the remaining 'dry gas' so far as practicable is taken into pipe lines, by which it is distributed to consumers, both domestic and commercial.

In certain of the oil fields, some of the casing-head gasoline is obtained as an incidental product to the compressing of the natural gas preliminary to its transmission to consuming centers through the gas pipe lines. Some concerns market the casing-head gasoline separately, others blend it with distillery gasoline, while others turn it into the oil pipe lines thus mixing this high-gravity gasoline with the crude oil for transportation to the refinery where it is later regained. A total of 489,798,683 gallons of casing-head gasoline valued at $45,700,264 from all fields was reported as made by 142 plants during 1927, compared with 389,026,757 gallons valued at $51,788,346 from 148 plants in 1926. It was distributed by counties as follows:

Natural-Gas Gasoline Recovered, 1927

County	*No. plants*	*Gallons*	*Value*
Fresno	1	1,460,000	$133,860
Kern	34	82,411,525	8,488,387
Los Angeles	53	162,042,699	16,364,313
Orange	38	78,346,009	7,834,601
Santa Barbara	4	12,008,500	1,200,850
Ventura	12	153,529,950	11,678,253
Totals	142	489,798,683	$45,700,264

The usual recoveries of gasoline from natural gas vary from ½ gal. to 3 gal. per 1000 cu. ft. of gas handled, the average being about 1 gal. per 1000 cu. ft. The U. S. Bureau of Mines report by Knudsen [1] gives the average recovery for 1927 as 1.457 gallons per 1000 cu. ft. of gas treated. His figures show the following production, by methods:

Natural-Gas Gasoline Production, 1927, by Methods

(Per U. S. Bureau of Mines)

Method	*Gallons*	*Recovery (Gal. per M cu. ft.)*
Oil absorption	266,915,524	1.523
Compressor	4,859,675	1.541
Combination compressor and oil absorption	176,149,048	1.546
Combination oil and charcoal absorption	40,886,138	1.165
Charcoal absorption	762,263	.088
Drip	169,865	---
Totals	489,742,513	1.457

PETROLEUM

Bibliography: State Mineralogist Reports IV, VII, X, XII, XIII. Bulletins 3, 11, 16, 19, 31, 32, 63, 69, 73, 82, 84, 89. Reports of Oil and Gas Supervisor 1915 to date (issued in monthly chapters since April, 1919). U. S. Geol. Surv., Bulletins 213, 285, 309, 317, 321, 322, 340, 357, 398, 406, 431, 471, 541, 581, 603, 621, 623, 653, 691; Prof. Papers 116, 117. "American Petroleum; Supply and Demand"; Amer. Petr. Inst., 1925.

The crude petroleum produced in California for 1927 amounted to a total of 231,195,774 barrels of clean oil, valued at $260,735,498 at the

[1] Knudsen, E. T., Statistical summary of California petroleum industry, 1927; U. S. Bureau of Mines, 1928, pp. 45, 46.

well. This total of quantity is compiled from the monthly production reports filed by the operators with the State Oil and Gas Supervisor, to which have been added figures for the output of a number of small operators in the old Los Angeles City Field not under the jurisdiction of the Supervisor.

The question of the value of the crude oil yield at the well is a difficult one to settle with exactitude principally because a large part of the output is not sold until after refining. The large refiners are also large producers of crude oil which they send direct from well to plant, hence much of the crude oil is not sold as such. The values used in the statistical reports of the State Mining Bureau since 1914 have been derived from averages of actual sales of crude oil of all grades in each field of the state, and these averages applied to the total yield of the respective fields. This we feel is a safer measure of commercial values than market quotations, because quotations do not always mean sales. This is particularly true on a rising or a falling market.

Features of 1927.

The noteworthy features of the year 1927 in the oil industry were increased output in Orange, Santa Barbara and Ventura counties and decreases in all other counties. There were sharp cuts in the price of crude oil in all grades over 20° Baumé, making the value in all counties less than in 1926.

Summarizing the data for the year, the State Oil and Gas Supervisor [1] presented the following figures:

"The total production of oil in the state for the last six months of 1927 was 114,891,618 barrels of oil and 58,897,272 barrels of water. The production of oil for the year 1927 was, therefore, 231,045,773 barrels, an increase of 6,522,349 barrels over that of 1926. The increased production came from the Seal Beach and Huntington Beach fields and while the Ventura field increased over 3,000,000 barrels, there was a nearly equal decrease in the fields of Kern County.

"The production of oil for the second half of 1927 was 1,262,537 barrels less than for the first half. Water production increased 3,290,754 barrels during the same period. * * *

"The estimated closed-in production was increased during 1927 from 61,314 barrels daily in January to a maximum of 89,442 barrels daily in May and decreasing to 77,107 barrels daily in December. * * *

"Storage and Price Changes.

"The total crude oil and refined petroleum in storage in Pacific coast territory at the end of 1927 was 137,395,067 barrels, according to the American Petroleum Institute. The decrease in storage during the year amounted to 8,217,109 barrels compared with a decrease of 11,704,133 barrels during 1926. The total amount of crude and refined oil shipped to eastern ports during 1927 was 33,080,000 barrels, or 42,000 barrels more than the 1926 shipments.

"On April 1, 1927, prices of crude oil of 15 degrees gravity and above in some fields, and of 19 degrees gravity and above in other fields, were lowered.

"Drilling and Development.

"During 1927, 1263 wells were reported to the State Oil and Gas Supervisor as ready to drill as compared with 1268 new wells in 1926. Five new fields were discovered in 1927, most of which are relatively unimportant. These fields were the Alamitos dome of the Seal Beach field, the Potrero field in Los Angeles County, the Rincon field in Ventura County, the Goleta field in Santa Barbara County, and the Round Mountain field in Kern County. Of these, the most important was the extension of the Seal Beach field, which contributed much to the 1927 production. The productive possibilities of the Rincon, Potrero and Round Mountain fields had not been determined at the end of the year. The Goleta field produced a small amount of high gravity oil and apparently reached its limit."

During 1927 there was a small production of high-grade petroleum from Colusa County. This was marketed for medicinal purposes.

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[1] Bush, R. D., Résumé of Oil Field Operations of California in 1927; Cal. State Min. Bur., 13th Ann. Rep. of State O. & G. Super., No. 8, Feb. 1928, pp. 5 and 6.

Production Figures.

The following table gives the production and value by counties for 1927 compared with the 1926 figures:

TABLE A

Production and Value of Crude Oil, by Counties

County	1926 Barrels	1926 Value	1927 Barrels	1927 Value
Fresno	7,340,102	$5,982,183	7,202,285	$5,977,176
Kern	54,549,646	78,987,887	51,570,412	58,738,699
Los Angeles	105,826,337	174,084,324	103,625,615	114,583,011
Orange	37,989,349	59,225,395	46,593,842	56,238,767
San Luis Obispo	27,982	22,162	16,709	12,531
Santa Barbara	1,925,204	1,526,587	2,173,887	1,630,415
Santa Clara	[a]	--------	11,994	14,212
Ventura	16,994,275	25,695,344	19,996,841	23,536,282
Kings, San Bernardino, San Mateo, Santa Clara, Sonoma	[a] 20,386	22,795	--------	--------
Colusa, Kings, San Bernardino, San Mateo, Sonoma	--------	--------	[a] 4,189	4,405
Totals	224,673,281	$345,546,677	231,195,774	$260,735,498

[a] Combined to conceal output of a single operator in each.

The foregoing totals show the average price of $1.127 per barrel for the year 1927 as compared with $1.538 in 1926, $1.422 in 1925 and $1.200 in 1924.

TABLE B

Average Price of Oil per Barrel, by Counties, 1918–1927

County	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Fresno	$0.825	$1.191	$1 293	$1.483	$1.068	$1.710	$1.162	$1.094	$0.815	$ 830
Kern	.893	1 252	1.350	1.714	1 211	.819	1.137	1.432	1.448	1.139
Los Angeles	1.176	1.340	1.380	1 532	1.403	.971	1.239	1.429	1 645	1 115
Orange	1 003	1.412	1.860	2 138	1 175	.880	1.183	1.417	1.559	1.207
San Luis Obispo	.926	.905	1.040	1.400	.942	.600	.992	1 087	-------	-----
Santa Barbara	.808	1 235	1.125	1.575	1.011	.782	1.036	.914	.793	.750
Santa Clara	1 387	1.700	1.600	1.485	1 616	1 404	1 921	1 634	-------	------
Ventura	1.318	1.480	1.635	2 507	1 785	1.138	1.334	1 710	1.512	1.177
State average	$0 908	$1 278	$1.409	$1 726	$1.249	$0 923	$1 200	$1 422	$1 538	$1.127

For several years previous to 1919, the state average value per barrel at the well for crude oil as determined by the statistical returns was noted to practically coincide with the quotations during the same years for 23° gravity oil in the San Joaquin Valley fields. In 1919 and since, the average values have worked out at figures corresponding to quotations up to, in one year as high as 28° oil, due to the large yield of high-gravity oils from the new fields in the Los Angeles-Orange counties area.

TOTAL PETROLEUM PRODUCTION OF CALIFORNIA

The presence of oil seepages and springs in Los Angeles and Ventura counties was known and utilized in a small way early in the history of California. Some also was shipped to refineries at San Francisco from Santa Barbara and Humboldt counties. In the light of present-day

developments, the following reference to the previous year's production of oil and its future prospects as expressed by the San Francisco Bulletin of January 8, 1866, is strikingly prophetic even though skeptical:

"It is possible that the small quantity received (40,000 or 50,000 gallons in 1865) may be the forerunner of many millions which will, at some future time, lubricate the wheels of commerce and set a trade at work excelling in variety any that has thus far been known on this coast. At present, however, we admit to being a little skeptical about the assumption of the astute Professor Silliman that California will be found to have more oil in its soil than all the whales in the Pacific Ocean."

According to Hanks,[1] in 1874 production amounted to 36 bbl. per day from natural flows in Pico Cañon (Newhall), and at Sulphur Mountain (Ventura County), the oil being of 32° gravity average.

[2] "Work was commenced in Pico Canyon in 1875 by drilling three shallow wells with spring pole, all of which yielded oil at depths of from 90 to 250 feet. Actual work of development commenced with steam machinery in 1877."

In 1877 Pico averaged 40–50 bbl. daily, and Ventura 80 bbl. daily. In 1878, there was some production (@ 60 bbl. per day, for a time) from wells in Moody Gulch, near Los Gatos, Santa Clara County, the oil being of 46° Baumé.

The first wells in the Coalinga, Fresno County, and Summerland, Santa Barbara County, fields were drilled in 1890, but Coalinga did not make its influence felt conspicuously on the state's annual output until 1903. The Summerland yield never has been large. The Salt Lake field near Los Angeles began production in 1894 and in 1897 reached over a million barrels annually.

In the Kern County fields, the first well was drilled in Sunset in 1891, Midway in 1900, McKittrick in 1892, Kern River in 1899. The Sunset-Midway district attained a yield of over 4,000,000 bbl. in 1909, and over 20,000,000 bbl. in 1910. Kern River field produced over 3,000,000 bbl. in 1901.

The first well in the Santa Maria-Lompoc group, Santa Barbara County, was drilled in 1901, and the district advanced to a yield of over 3,000,000 bbl. annually in 1905.

The Whittier-Fullerton field in Los Angeles and Orange counties became an important factor in 1902. The Montebello field, Los Angeles County, was the conspicuous addition in 1918-1919; and Elk Hills, Kern County, with Huntington Beach and Richfield, Orange County, in 1920. In 1921, the new fields added were Long Beach and Santa Fe Springs, Los Angeles County; in 1922, Torrance field in Los Angeles County, and Wheeler Ridge field in Kern County; but the production from the large number of new wells started in these new Los Angeles County fields did not reach its peak until August and September, 1923. Dominguez (Compton) came in during 1923; followed by Rosecrans and Inglewood in 1924. Ventura recorded important additions to its producing area in 1925 and 1926. Seal Beach, Orange County, and Mt. Poso, Kern County, were the new fields added in 1926; Round Mountain, Kern County, and Rincon, Ventura County, were the new fields added in 1927.

[1] Hanks, Henry G., Report IV of State Mineralogist, p. 298, 1884.
[2] *Idem*, p. 301.

The effect of the advent of these various fields to the producing column will be noted in the tabulation herewith, by years:

TABLE C

Total Petroleum Production in California.

Year	Barrels	Value	Year	Barrels	Value
To and inc. 1875	(a) 175,000	(b) $472,500	1903	24,340,839	$7,313,271
1876	12,000	30,000	1904	29,736,003	8,317,809
1877	13,000	29,250	1905	34,275,701	9,007,820
1878	15,227	30,454	1906	32,624,000	9,238,020
1879	19,858	39,716	1907	40 311,171	16,783,943
1880	40,552	60,828	1908	48,306,910	26,566,181
1881	99,862	124,828	1909	58,191,723	32,398,187
1882	128,636	257,272	1910	77,697,568	37,689,542
1883	142,857	285,714	1911	84,648,157	40,552,088
1884	262,000	655,000	1912	89,689,250	41,868,344
1885	325,000	750,750	1913	98,494,532	48,578,014
1886	(a) 377,145	(b) 870,205	1914	102,881,907	47,487,109
1887	678,572	1,357,144	1915	91,146,620	43,503,837
1888	690,333	1,380,666	1916	90,262,557	57,421,334
1889	303,220	368,048	1917	95,396,309	86,976,209
1890	307,360	384,200	1918	99,731,177	127,459,221
1891	323,600	401,264	1919	101,182,962	142,610,563
1892	385,049	561,333	1920	103,377,361	178,394,937
1893	470,179	608,092	1921	112,599,860	203,138,225
1894	783,078	1,064,521	1922	138,468,222	173,381,265
1895	1,245,339	1,000,235	1923	262,875,690	242,731,309
1896	1,257,780	1,180,793	1924	228,933,471	274,652,874
1897	1,911,569	1,918,269	1925	232,492,147	330,609,829
1898	2,249,088	2,376,420	1926	224,673,281	345,546,677
1899	2,677,875	2,660,793	1927	231,195,774	260,735,498
1900	4,329,950	4,152,928			
1901	7,710,315	2,961,102	Totals	2,775,824,546	$2,823,636,620
1902	14,356,910	4,692,189			

[a] U. S. G. S., Min. Res. of U. S., 1886, p. 440, for quantities to and including 1886.
[b] Values have been estimated for the years to and including 1886, after consulting a number of contemporaneous publications, including the Mining & Scientific Press, Reports of the State Mineralogist, and U. S. Reports. The figures for 1887 to date are from records of the State Mining Bureau.

Well Data.

The following table is compiled from the monthly statements issued by the American Petroleum Institute:

TABLE D

Wells Operated by Fields, 1927

Field	Wells producing Dec. 1926	Wells producing Dec. 1927	Wells completed during year	Daily initial output	Wells abandoned during year	Bbls. per well produced per day Dec. 1926	Bbls. per well produced per day Dec. 1927
Kern River	1,339	1,365	121	21,559	9	9.2	17.0
Mount Poso		4	6	2,975	7		27.7
Round Mountain			1	500	1		
McKittrick	310	302	13	428		17.3	16.3
Midway-Sunset	2,985	2,863	91	12,354	35	30.2	28.2
Elk Hills	245	227	1	25		141.3	105.5
Lost Hills-Belridge	312	309	3	332		15.7	13.4
Coalings	954	973	9	563	15	20.3	87.2
Wheeler Ridge	28	30	3	269	2	35.2	32.9
Watsonville	6	6				9.7	9.7
Santa Maria-Lompoc	215	215	6	1,675	7	22.3	27.1
Summerland	135	91	1	25		1.0	1.4
Goleta		7	8	2,615	3		33.0
Rincon (Seacliff)		1	2	1,875	1		157.0
Ventura Ave	76	100	40	62,987		695.8	482.2
Ventura-Newhall	521	507	15	1,854	23	117.5	11.7
Los Angeles-Salt Lake	371	331			16	5.0	4.8
Whittier	185	183	1	60	5	10.4	9.4
Fullerton	444	386	15	6,732	3	60.3	38.8
Coyote	211	210	6	830	3	74.4	66.0
Santa Fe Springs	351	317	4	944	21	123.7	122.4
Montebello	186	177	6	1,155	2	93.6	73.1
Richfield	198	256	72	19,601	18	94.7	84.5
Huntington Beach	449	574	209	73,586	24	21.0	104.2
Long Beach	711	636	48	50,257	146	132.7	170.4
Torrance (Redondo)	661	655	12	1,194	11	39.8	31.1
Dominguez (Compton)	75	74	9	2,854	5	262.1	183.9
Rosecrans	137	117	9	3,972	26	91.4	72.8
Inglewood	212	226	17	3,760	2	186.6	135.2
Seal Beach	5	131	169	204,399	30	14.0	324.5
Potrero			1	500			
Newport	11	5	3	25	2	84.4	3.0
Miscellaneous drilling					120		
Totals	11,333	11,284	901	479,905	537	†57.7	†54.1

† State average.

Specific Gravity of Oils Produced.

The proportion of heavy and light oil produced in the various fields is shown in Table E, following, for which we are indebted to the Standard Oil Company. Under present practice, oil below 18° Baumé may be considered as largely refinable for fuel and lubricants, while the lighter oils yield varying amounts of the higher refined products with corresponding proportions of residuum and fuel oil. Specific gravities in California range from 8° Baumé in the Casmalia field, Santa Barbara County, to 56° Baumé in Ventura County.

California crude oils are all essentially of asphalt base, with a few notable exceptions. In the following localities are wells yielding crudes containing both asphalt and paraffine constituents: Oil City field, Coalinga; a few deep wells in East Side field, Coalinga; a considerable part of the Ventura County fields; Western Minerals area, south of Maricopa; Wheeler Ridge, Kern County.

TABLE E

Production of Light and Heavy Oil, by Fields, 1927

Field	*Under 18°* (*barrels*)	*18° and above* (*barrels*)	*Total* (*barrels*)
Kern River	6,185,160	----------	6,185,160
Lost Hills-Belridge	414,692	1,108,564	1,523,256
McKittrick	1,845,117	----------	1,845,117
Midway-Sunset	8,166,365	23,412,782	31,579,147
Elk Hills	1,622,129	8,474,919	10,097,048
Coalinga	3,713,483	3,429,962	7,143,445
Wheeler Ridge	--------	375,425	375,425
Watsonville	23,725	----------	23,725
Santa Maria	909,988	1,079,771	1,989,759
Summerland	52,525	----------	52,525
Ventura-Newhall	57,675	2,159,465	2,217,140
Ventura Avenue	--------	17,796,011	17,796,011
Los Angeles-Salt Lake	610,537	10,304	620,841
*Montebello	104,790	5,364,630	5,469,420
*Whittier	54,198	605,612	659,810
*Coyote	11,168	5,128,848	5,140,016
*Fullerton	133,573	6,874,989	7,008,562
*Richfield	479,185	7,399,605	7,878,790
Santa Fe Springs	--------	15,155,701	15,155,701
Huntington Beach	560,202	25,802,332	26,362,534
Torrance	3,310,942	5,050,855	8,361,797
Long Beach	252,549	34,310,762	34,563,311
Dominguez	3,860	5,890,028	5,893,888
Rosecrans	--------	3,494,404	3,494,404
Inglewood	2,374,174	10,385,933	12,760,107
Seal Beach	--------	16,443,492	16,443,492
Goleta	--------	88,840	88,840
Rincon	--------	6,000	6,000
Miscellaneous	11,898	572	12,470
Totals	30,897,935	199,849,806	230,747,741

* Formerly reported as Whittier-Fullerton.

As previously noted by Bradley,[1] a decided change has taken place in the relative proportions of light and heavy crudes produced in California since 1910, taking 18° Baumé as the dividing line. This subject has also been covered in detail and with charts, by Collom and Barnes.[2]

A marked drop took place in the low-gravity yield from 1910 to and including 1914. From 1914, it remained almost stationary, with a slight drop in 1921, while the high-gravity yield has increased at a rapid rate since 1915. The proportions have been reversed from approximately 75% low—25% high in 1914 to 25% low—75% high in 1921; 10% low—90% high in 1923; 14% low—86% high in 1924–1927.

This has been an important factor in its effect upon the average price per barrel of the state's output in these years, as well as its effect upon the relative situation between production and consumption. It has been a fortunate development, in view of the increased demand for refinery products (gasoline in particular).

Oil in 'Storage.'

Field, refinery, pipe-line, and tank-farm stocks of crude and refined products in the Pacific Coast territory totaled 137,395,067 barrels[3] December 31, 1927, compared with 145,612,176 barrels on December 31, 1926. The total decrease in stock for the year was 8,217,109 barrels.

[1] Bradley, W. W., Mineral Production of California in 1921; Cal. State Min. Bur., Report XVIII, p. 442, Sept., 1922.

[2] Collom, R. E., and Barnes, R. M., California Oil Production and Reserves; Cal. State Min. Bur., Ninth Ann. Rep. of State Oil and Gas Supervisor, Aug., 1923, pp. 5–23.

[3] Standard Oil Bulletin, February, 1928, p. 11.

Stocks	*Dec. 31, 1927 (barrels)*	*Dec. 31, 1926 (barrels) (revised)*
Heavy crude, heavier than 20° A. P. I., including all grades of fuel	93,013,061	88,707,499
Refinable crude, 20° A. P. I. and lighter	20,268,569	30,835,057
Gasoline	12,725,841	11,673,563
Naphtha distillates	1,901,279	3,832,042
All other stocks	9,486,317	10,564,015
Totals of all stocks	137,395,067	145,612,176

Operating Data.

The following tabulation (Table F) is compiled from data published by the Department of Petroleum and Gas,[1] semiannually, and here combined to show the entire year's operations for all fields. The districts are the geographical subdivisions as administered by the Department, and which are outlined on the accompanying map.

It will be noted that the state average yield of oil per well per day was 62.0 barrels for the first six months of 1927 and 59.6 barrels for the second. This is somewhat higher than the figure of 54.1 barrels average for December derived from American Petroleum Institute data as shown in Table D, on a preceding page, due in part at least, to the fact that the latter is on a full-time basis, whereas the Bureau figures allow for shut-down time.

[1] Summary of Operations, California Oil Fields; Cal. State Min. Bur., Thirteenth Ann. Rep. of State Oil and Gas Supervisor, Aug., 1927, pp. 6–7; Feb., 1928, pp. 8–9.

TABLE F. Production Statistics and Operating Data of California Oil Fields—1927

Field	January 1 to June 30						July 1 to December 31					
	Average number of producing wells—actual	Oil (bbls.)	Number of days producing	Production per well per day (bbls.)		Percentage of time wells produced	Average number of producing wells—actual	Oil (bbls.)	Number of days producing	Production per well per day (bbls.)		Percentage of time wells produced
				Oil	Water					Oil	Water	
Dist. 1—Beverly Hills	15	71,504	2,519	28.4	36.2	92.8	14	66,088	2,366	27.9	22.4	92.2
Brea-Olinda	120	3,930,197	68,968	57.0	14.8	90.7	383	3,138,127	64,797	48.4	14.5	91.9
Coyote Hills	207	2,635,661	36,126	73.0	37.0	96.4	205	2,560,840	36,594	70.0	34.4	97.0
Dominguez	77	3,181,346	13,116	242.6	40.3	94.7	77	2,743,018	13,687	200.4	46.7	96.6
Huntington Beach	[a]539	14,474,673	88,105	164.3	33.1	90.3	[b]594	11,889,72[illegible]	100,153	118.7	35.1	91.6
Inglewood	216	6,844,144	37,574	182.2	25.8	96.1	224	6,075,843	39,607	153.4	25.3	96.1
Long Beach	[a]723	16,691,199	121,327	137.6	65.5	92.7	[b]679	17,644,691	117,088	150.7	73.0	93.7
Montebello	198	2,937,773	34,325	85.6	71.5	95.8	200	2,561,427	35,396	72.3	68.8	96.2
Newhall	77	33,855	13,534	2.5	4.0	97.1	77	34,411	13,974	2.5	3.8	98.6
Newport	[a]11	11,227	1,120	10.0	19.1	56.3	[b]8	11,560	759	15.2	28.3	51.6
Richfield	216	3,820,861	35,871	106.5	7.6	91.8	250	4,122,070	43,744	94.2	7.9	95.1
Rosecrans	127	1,970,204	21,205	92.9	49.2	92.2	119	1,531,666	20,580	74.4	55.6	94.0
Salt Lake	81	173,268	14,200	12.2	17.7	96.8	80	162,076	14,191	11.4	23.9	96.4
Santa Fe Springs	347	7,897,094	59,137	133.5	71.0	94.2	335	7,325,631	58,449	125.3	67.0	94.8
Seal Beach	48	6,262 664	6,048	1,035.5	56.1	69.6	141	10,238,107	20,682	495.0	77.1	79.7
Torrance	[a]669	4,437,919	113,961	38.9	3.4	94.1	[b]669	3,927,537	116,484	33.7	4.1	94.6
Whittier	176	342,488	28,088	12.2	26.7	88.2	177	321,662	32,178	10.0	24.9	98.8
Totals	4,147	75,716,077	695,224	108.9	35.4	92.6	1,232	74,354,480	730,729	101.8	37.1	93.4
Dist. 2—Bardsdale	150	157,564	26,437	6.9	0.8	97.4	150	149,577	25,558	5.9	1.0	92.6
Conejo	[a]13	804	1,243	0.6	13.2	52.8	28	755	3,495	.2	1.6	67.8
Ojai	67	32,305	11,235	2.9	2.0	92.6	69	29,822	11,603	2.6	1.5	91.4
Piru	88	77,105	13,723	5.6	6.3	86.2	84	62,365	12,159	5.1	3.2	78.7
**Rincon							2	7,888	12	657.3	23.8	.4
Santa Paula	23	10,068	3,325	3.0	1.8	79.9	27	13,315	4,406	3.0	1.4	88.7
Sespe	24	30,698	4,003	7.7	0.2	92.2	25	35,316	3,643	9.7	.1	79.2
Simi	48	23,046	7,897	2.9	1.1	90.9	48	23,652	7,802	3.0	1.0	88.3
South Mountain	74	727,616	11,905	61.1	0.4	88.9	79	748,309	12,520	59.8	.3	86.1
Ventura	98	8,621,363	15,499	556.3	49.4	87.4	115	9,245,273	19,422	476.0	52.1	91.8
Totals	585	9,680,569	95,267	101.6	9.8	90.0	627	10,31[illegible],272	100,620	102.5	11.1	87.2

Dist. 3—Arroyo Grande	11	8,747	1,555	5.6	3.1	78.1	7	7,962	1,246	6.4	.4	96.7
Casmalia	12	14,636	2,052	7.1	56.1	94.5	11	15,427	1,922	8.0	81.1	94.9
Cat Canyon	36	427,650	5,454	78.4	4.2	83.7	40	519,465	6,496	79.9	5.0	88.2
Goleta	2	32,851	195	168.5	47.6	78.0	6	61,342	816	75.1	54.6	73.9
*Half Moon Bay	4	388	362	1.1	0.3	50.0	4	388	368	1.1	.3	50.0
Lompoc	0	0	0	0	0	0	0	0	0	0	0	73.9
Moody Gulch	0	0	0	0	0	0	1	706	122	5.8	0	66.3
Santa Maria	158	491,304	21,555	22.8	42.6	75.4	176	571,191	25,037	22.4	40.0	77.3
Sargent	9	5,855	1,629	3.6	0	100.0	9	5,433	1,593	3.4	0	96.2
*Summerland	93	19,829	15,438	1.3	12.7	91.7	93	20,192	15,694	1.3	12.7	91.1
Totals	325	1,001,260	48,240	20.8	26.2	82.0	347	1,202,106	53,294	22.6	26.9	83.4
Dist. 4—Belridge-Lost Hills, Devils Den	278	784,023	46,298	16.9	33.8	92.0	263	719,297	46,325	15.5	32.8	95.7
Elk Hills	247	5,332,365	40,299	132.3	17.5	90.1	223	4,645,968	38,209	121.6	22.4	93.1
Kern River	1,346	2,413,075	227,262	10.6	53.2	93.3	1,339	3,435,416	233,763	14.7	50.4	94.9
McKittrick-Temblor	299	955,816	51,743	18.5	82.8	95.6	301	916,272	52,902	17.3	76.2	95.5
Midway-Sunset	2,946	16,426,858	497,354	33.0	16.4	93.3	2,864	15,511,929	494,140	31.4	18.0	93.8
Mount Poso	3	26,459	120	220.5	.7	22.1	2	15,544	83	187.3	.4	22.6
Round Mountain							1	12,808	38	337.0	0	20.7
Wheeler Ridge	28	189,298	4,942	38.3	3.8	97.5	30	185,284	5,289	35.0	3.4	95.8
Totals	5,147	26,127,894	868,018	30.1	30.9	93.2	5,023	25,442,518	870,749	29.2	31.1	94.2
Dist. 5—Coalinga	967	3,627,648	166,836	21.7	11.8	95.3	979	3,574,637	172,081	20.8	12.4	95.5
Kings County							1	1,510	127	11.9	17.8	83.0
Sonoma County	1	707	162	4.3	0.0	89.5	0	95	31	3.0	0	16.9
Totals	968	3,628,355	166,998	21.7	11.8	95.3	980	3,576,242	172,239	20.7	12.4	95.5
Grand totals	11,172	116,154,155	1,873,747	62.0	29.7	92.7	11,209	114,891,618	1,927,631	59.6	30.6	93.5

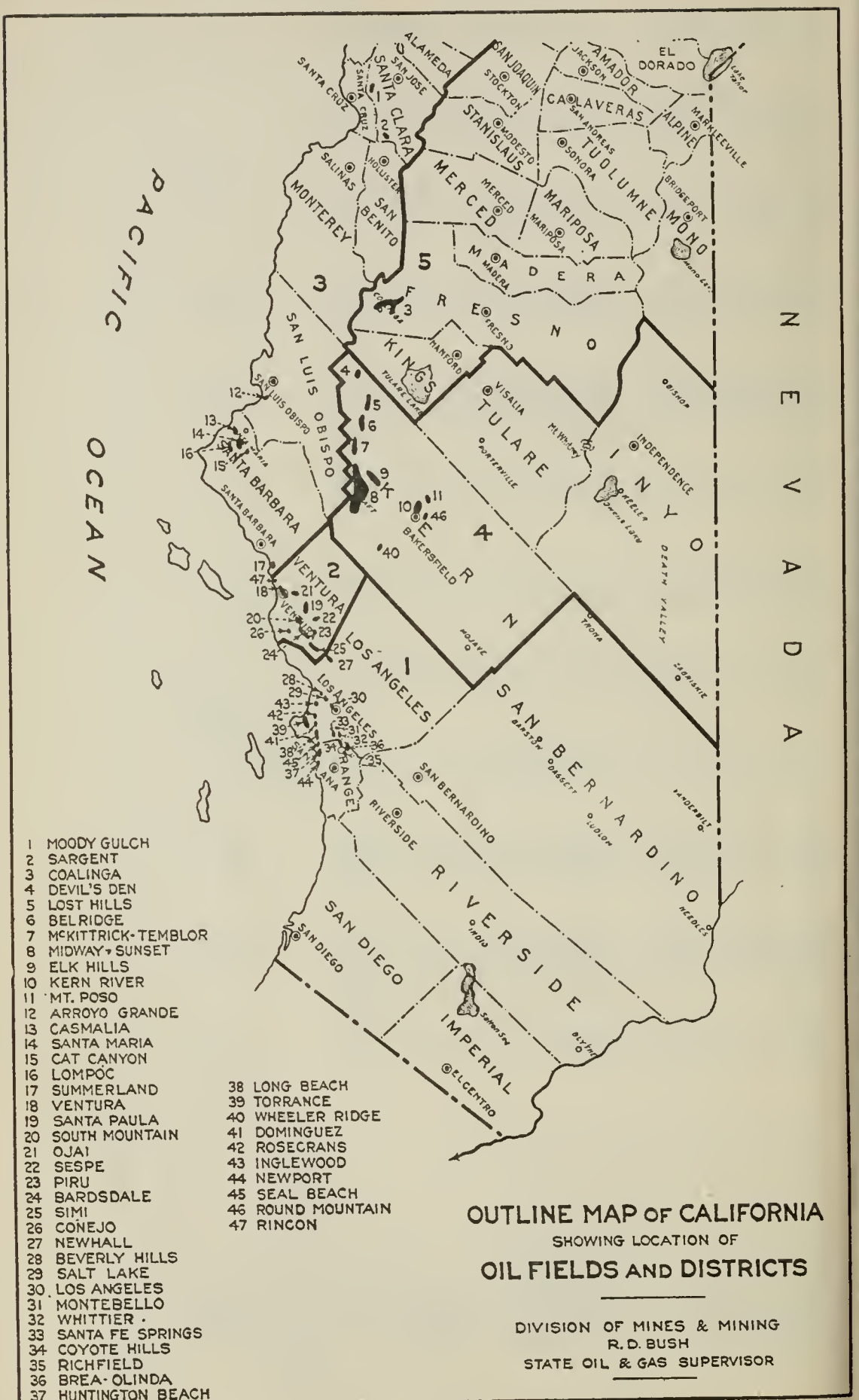
[a]The exact production for some wells could not be obtained and the following estimates were incorporated in the above figures:

Dist. 1—Huntington Beach	2	23,300	274
Long Beach	9	63,730	1,366
Newport	1	215	21
Torrance	3	8,060	531
Dist. 2—Conejo	1	150	33

[b]The exact production for some wells could not be obtained and the following estimates were incorporated in the above figures:

Dist. 1—Huntington Beach	9	90,270	1,057
Long Beach	3	57,875	485
Newport	2	902	95
Torrance	1	3,000	150

*Estimated.
**Began producing February 26, 1927.



1 MOODY GULCH
2 SARGENT
3 COALINGA
4 DEVIL'S DEN
5 LOST HILLS
6 BELRIDGE
7 McKITTRICK-TEMBLOR
8 MIDWAY-SUNSET
9 ELK HILLS
10 KERN RIVER
11 MT. POSO
12 ARROYO GRANDE
13 CASMALIA
14 SANTA MARIA
15 CAT CANYON
16 LOMPOC
17 SUMMERLAND
18 VENTURA
19 SANTA PAULA
20 SOUTH MOUNTAIN
21 OJAI
22 SESPE
23 PIRU
24 BARDSDALE
25 SIMI
26 CONEJO
27 NEWHALL
28 BEVERLY HILLS
29 SALT LAKE
30 LOS ANGELES
31 MONTEBELLO
32 WHITTIER
33 SANTA FE SPRINGS
34 COYOTE HILLS
35 RICHFIELD
36 BREA-OLINDA
37 HUNTINGTON BEACH
38 LONG BEACH
39 TORRANCE
40 WHEELER RIDGE
41 DOMINGUEZ
42 ROSECRANS
43 INGLEWOOD
44 NEWPORT
45 SEAL BEACH
46 ROUND MOUNTAIN
47 RINCON

OUTLINE MAP OF CALIFORNIA
SHOWING LOCATION OF
OIL FIELDS AND DISTRICTS

DIVISION OF MINES & MINING
R. D. BUSH
STATE OIL & GAS SUPERVISOR

Financial and Operating Conditions of California Oil Fields, 1927.

Financial results of the oil business during 1927 are shown by the following tables. The features worthy of mention are: (1) There were 487 operating companies in 1927 with a total capitalization value of $1,272,555,286 (see Table G), which was a decrease in the number of companies from 491 in 1926 with an increased capitalization from $1,241,242,935. (2) A total increase in dividends was paid, with all counties showing an increase over their 1926 dividends, with the exception of Fresno and Santa Barbara (see Table H). (3) An increase in the barrels per well per day (see Table I) in Santa Barbara and Ventura counties, with a decrease in all other counties and a marked drop in Los Angeles County. (4) A slightly less operating cost in all counties with the exception of Los Angeles and Orange.

With reference to Table I, it should be noted that although it lacks data from the larger operators who have refineries and with interests in more than one field, yet the data given are of economic value and interest in that they indicate the conditions prevailing among the smaller companies and operators.

Operating cost per well is not always lower for the dividend companies than others. Profitable operations seem to depend generally upon large wells, high-grade oil, and proximity to market. Price and profits have usually been greater in the Los Angeles-Orange-Ventura fields than in others, doubtless largely due to the proximity to market and higher grades of oil. Crude oil testing as high as 56° Baumé is obtained from some of the Ventura wells.

TABLE G. Capitalization

Field	Number of companies considered*	Per cent of total product of field	Capital	
			Cash	Property
Fresno County—Coalinga	40	12	$2,590,098	$8,057,221
Kern County—				
Kern River	33	26	7,649,187	5,465,164
Midway	56	35	3,476,801	14,366,980
Sunset and Maricopa	27		4,165,140	8,654,977
McKittrick, Lost Hills, Belridge, Devil's Den, Elk Hills	34	19	2,687,316	4,173,074
Los Angeles County	103	13	15,121,629	23,047,533
Orange County	49	21	8,629,992	28,911,623
Santa Barbara County	14	47	2,651,646	2,290,584
Ventura County	40	12	2,289,883	9,421,859
Subtotals	396		$49,261,692	$104,389,015
Miscellaneous and marketing companies[a]	91	80	89,670,607	1,029,233,972
Totals	487		$138,932,299	$1,133,622,987

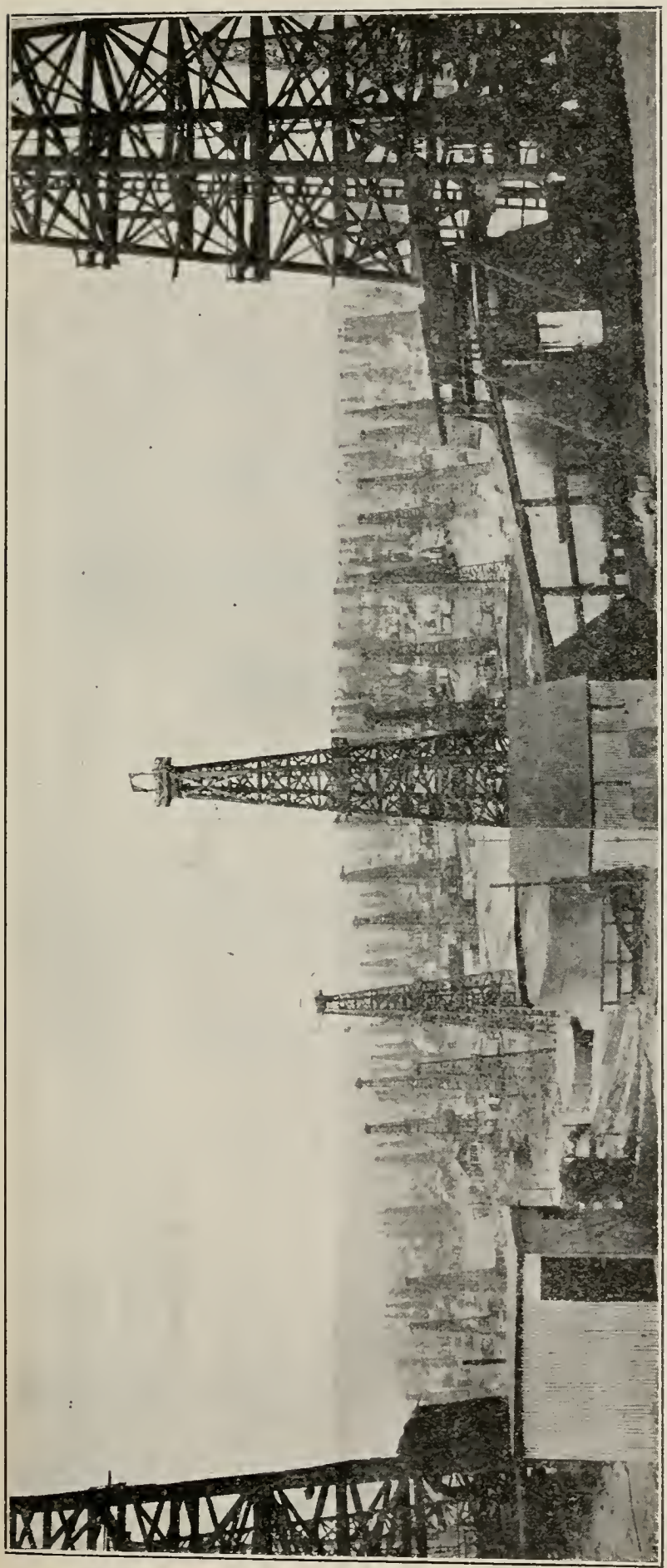
* See Table I following.

[a] Includes companies having refineries, and those operating in several fields whose data could not be segregated as to counties or fields.

TABLE H. Dividends Paid by Oil Companies. 1922-1927

Field	1922		1923		1924		1925		1926		1927	
	Companies	Value	Companies	Value	Companies	Value	Companies	Value	Companies	Value	Companies	Value
Fresno County—												
Coalinga	20	$893,210	17	$383,675	13	$239,985	20	$815,625	13	$300,799	8	$101,983
Kern County—												
Kern River	20	594,306	13	187,170	20	67,468	20	1,083,147	15	156,517	15	158,978
Midway	30	2,706,985	19	2,438,695	31	3,528,930	27	5,078,020	22	5,021,540	22	4,827,224
Sunset, Maricopa and Wheeler Ridge	19	936,174	11	259,569	13	739,494	13	306,089	6	563,557	3	91,324
McKittrick, Belridge, Lost Hills, Devils Den, Elk Hills	10	733,460	11	1,021,602	5	1,594,497	6	762,526	11	795,435	6	2,133,598
Los Angeles County	16	1,442,470	32	5,627,346	34	3,458,221	36	9,172,047	41	4,160,848	31	4,210,460
Orange County	8	331,345	12	897,119	11	2,717,050	15	1,194,391	11	1,442,884	21	3,198,112
Santa Barbara County	5	317,014	3	163,600	3	221,916	2	124,267	2	121,200	----	----
Ventura County	7	1,204,631	4	126,784	4	303,000	5	438,407	6	268,607	4	910,954
Subtotals	135	$9,159,595	122	$11,105,560	134	$12,870,561	144	$18,974,519	127	$12,831,387	110	$15,632,633
Miscellaneous and marketing companies[a]	10	41,030,594	10	44,398,555	36	52,150,372	27	53,459,294	28	53,231,591	19	60,943,916
Totals	145	$50,190,189	132	$55,504,115	170	$65,020,933	171	$72,433,813	155	$66,062,978	129	$76,576,549

[a] See Table G, preceding.



Long Beach Oil Fields, looking northwest from Signal Hill.

Photo by Walter W. Bradley

TABLE I. Average Prices of Light and Heavy Oils, and Operating Data, 1927.

Field	Price				Operating data					
					All companies considered*			Dividend companies[a]		
	Under 18° Baume	18° and over	Average price	Price to dividend companies	Barrels per well per day yield	Operating cost per well day	Operating cost per barrel	Barrels per well per day yield	Operating cost per well day	Operating cost per barrel
Fresno County—										
Coalinga	$0.844	$0.779	$0.830	$0.969	9.260	$3.477	$0.375	11.220	$4.125	$0.368
Kern County—										
Kern River	0.711		0.711	0.709	7.026	2.863	0.407	8.418	1.910	0.227
Midway	0.675	1.536	1.374	1.478	31.827	14.065	0.442	39.928	16.394	0.411
Sunset and Maricopa	0.800	0.847	0.811	0.818	15.903	6.208	0.390	26.153	5.996	0.229
McKittrick, Lost Hills, Belridge, Devils Den, Elk Hills	0.793	0.827	0.816	0.819	21.782	5.683	0.265	26.489	7.297	0.275
Los Angeles County	1.112	1.351	1.115	1.055	51.500	27.029	0.526	118.341	36.967	0.312
Orange County	1.078	1.336	1.207	1.355	69.077	54.099	0.783	78.470	18.881	0.241
Santa Barbara County	0.754	0.742	0.750		45.276	14.554	0.321			
Ventura County	0.799	1.179	1.177	1.300	24.810	13.696	0.552	24.540	15.165	0.618

*See Table G, preceding. Does not include companies with refineries, nor those operating in several fields whose data could not be segregated as to counties or fields. The data given are of value, however, as showing the conditions obtaining among the smaller operators.

[a]See Table H, preceding.

It should be noted that in the case of a county like Ventura, with only a few producers, the averages are not so significant as in other fields with a large number of operators. The figures of a single large operator in such a case can materially affect the general average if they should be much above or below the average of the others.

Proved Oil Land.

The total proved oil land of the state is 125,131 acres, an increase during 1927 of 3696 acres. Of this amount 23,927 acres, being owned by federal, state and city governments, or for other reasons, is not assessable for the support of the Department of Petroleum and Gas of the Division of Mines and Mining. The acreage in 1927 was distributed by counties as follows:

TABLE J

Proved Oil Lands and Number of Wells, 1927

County	*Land (acres)*	*Number wells Dec. 31, 1927*
Fresno	14,665	985
Kern	80,075	5,574
Los Angeles*	10,794	3,311
Orange	6,797	1,422
San Luis Obispo	308	18
Santa Barbara	7,474	329
Santa Clara	80	4
Ventura	4,938	699
Kings, San Bernardino and Sonoma	----	3
Totals	125,131	12,345

* Not including the old Los Angeles city field.

CHAPTER THREE

METALS

Bibliography: Reports of State Mineralogist I–XXII (inc.). Bulletins 5, 6, 18, 23, 27, 36, 50, 57, 76, 78, 85, 92, 95. Spurr and Wormser, "Marketing of Metals and Minerals." See also under each metal.

The total value of metals produced in California during 1927 was $17,990,841. The chief of these is, and always has been, gold, followed by copper, silver, quicksilver, zinc, tungsten, lead, titanium, iron ore and platinum. There was a small output of antimony. There was no production of arsenic, cadmium, molybdenum, nor tin, which have in the past been on the active list. Deposits of ores of nickel and vanadium have also been found in the state; although there has yet been no commercial output of them. The above-noted total of this group is a net decrease of $2,937,903 from the 1926 total of $20,928,744, due mainly to decreases registered by copper, gold and silver, in spite of an increase by quicksilver.

California leads all states in the Union in her gold production and is credited with approximately 26% of the nation's yield in 1927. The precious metal is widely distributed through the state. Thirty-four of the fifty-eight counties reported an output in 1927 from either mines or dredges.

Copper, which is second in importance among the metals of the state, occurs in the following general districts: the Shasta County belt, which has been by far the most important; the Coast Range deposits, extending more or less continuously from Del Norte in the north to San Luis Obispo County in the south; the Sierra Nevada belt, starting in Plumas and running in a general southerly and southeasterly direction through the Mother Lode counties and ending in Kern; the eastern belt in Mono and Inyo counties, and the southern belt in San Bernardino, Riverside and San Diego counties.

Silver is not generally found alone in the state, except notably in the Rand district, San Bernardino County; but is associated to a greater or less extent with gold, copper, lead and zinc.

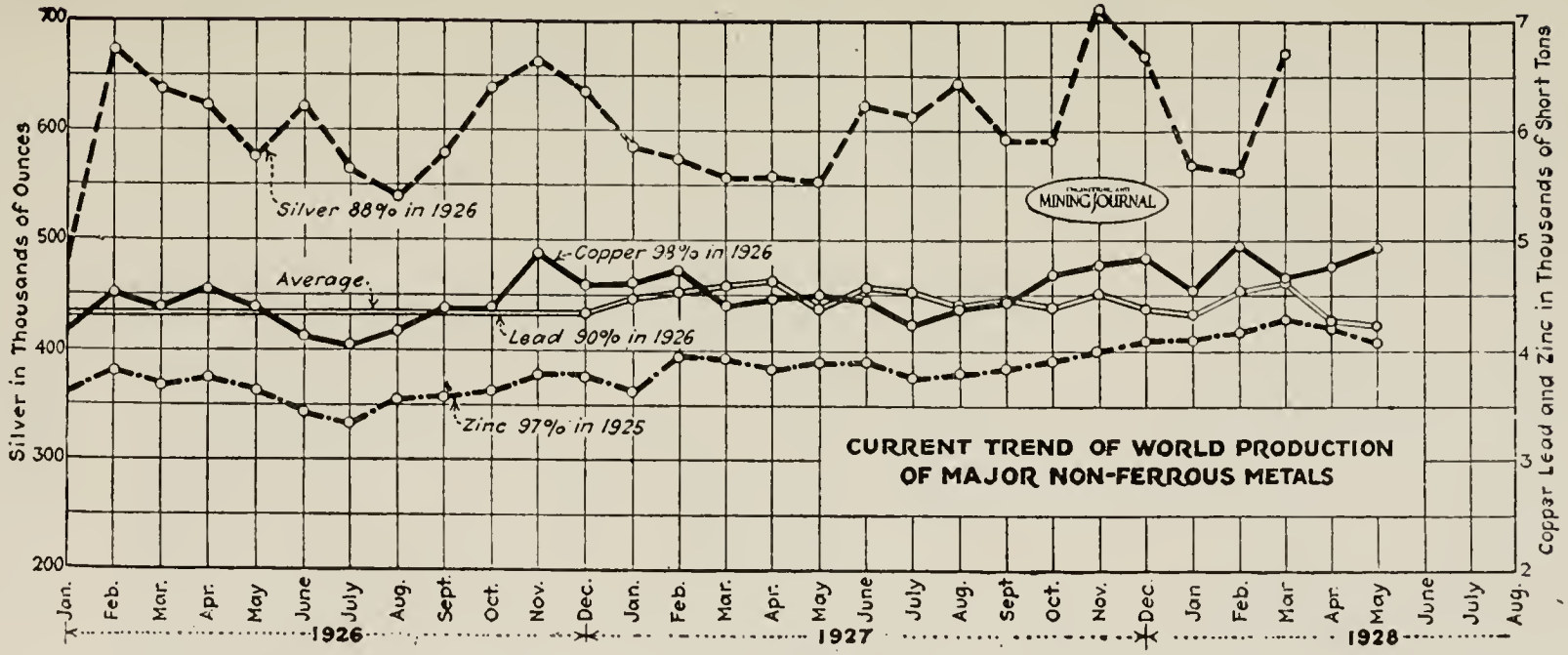
Quicksilver has for many years been one of the state's staple products and California has supplied approximately 75% of the nation's output of this metal.

Tungsten is found in but few other localities of importance in the United States.

Large deposits of iron ore have long been known in several sections of the state, but for various economic reasons this branch of the mineral industry thus far has made only slight progress on the Pacific Coast.

Titanium is associated with some of California's iron deposits. This mineral is widely distributed through the United States, but the deposits of this state are among the few that are considered of commercial importance.

Although the United States is a large consumer of certain metals, in fact the largest particularly of chromium and tin, our production from domestic sources is deficient. We have large reserves of low-grade



The curves are not to be considered as permanent records of production. They show merely the current trend in terms of daily output according to the latest estimates of the American Bureau of Metal Statistics. The figures represent production from countries that produce approximately 98 per cent of the world's copper, 97 per cent of the zinc, 90 per cent of the lead, and 88 per cent of the silver. The figures for lead on the new basis are not available for the individual months of 1926, and accordingly a horizontal line showing the monthly average reduced to a daily rate is shown. Delay in receipt of statistics from Mexico accounts for the failure of the silver curve to be up to date.—From *Engineering and Mining Journal*, July 14, 1928.

chromite, manganese, tungsten, and antimony ores, but they can not fully supply our commercial needs.

A comparison of the 1927 output with that of the 1926 is afforded by the following table:

Substance	1926		1927		Increase+ Decrease— Value
	Amount	Value	Amount	Value	
Copper	33,521,544 lbs.	$4,693,014	27,350,316 lbs.	$3,582,885	$1,110,129—
Gold	---	11,923,481	---	11,671,018	252,463—
Lead	8,067,873 lbs.	645,429	2,748,440 lbs.	173,151	472,278—
Manganese ore	235 tons	4,700	---	---	4,700—
Platinum	306 fine oz.	32,005	139 fine oz.	10,749	21,256—
Quicksilver	5,892 flasks	516,382	6,488 flasks	714,418	198,036+
Silver	2,022,460 fine oz.	1,262,015	1,620,242 fine oz.	918,677	343,338—
Tungsten concentrates	441 tons	316,560	*	*	—
Zinc	20,447,559 lbs.	1,533,568	8,625,005 lbs.	552,000	981,568—
Unapportioned*	---	[a]1,590	---	[b]367,943	366,353+
Total value		$20,928,744		$17,990,841	
Net decrease					$2,937,903—

* Under 'Unapportioned'.
[a] Includes iron ore and antimony.
[b] Includes antimony, iron ore, tungsten and titanium.

ALUMINUM

Bibliography: Report XVIII, p. 198. Bulletins 38, 67. U. S. Geol. Surv., Min. Res. of U. S.

To date there has been no commercial production of aluminum ore in California Only a single authenticated occurrence of bauxite has thus far been noted in this state, being in Riverside County, southeast of Corona, but as yet undeveloped.

Minerals containing aluminum are abundant, the most widely distributed being the clays. There are only two, however, thus far of consequence commercially, in the production of the metal: bauxite (to which may be added the related hydrated oxides, hydrargillite and diaspore) and cryolite. Cryolite is found in commercial quantities only in south Greenland, and was formerly the only ore of aluminum used, being still employed as a flux in the extraction of the metal. Bauxite has been, for some years, the most important source of aluminum and its salts. Its color varies from gray to red, according to the amount of iron present, the composition ranging usually between the following limits: Al_2O_3, 30%–60%; Fe_2O_3, 3%–25%; SiO_2, 0.5%–20%; TiO_2, 0.0%–10%. Besides its reduction to the metal bauxite is also utilized in the manufacture of aluminum salts, refractory bricks, alundum (fused alumina) for use as an abrasive, and in the refining of oil. The most important producing countries, both of bauxite and the metal, are the United States and France, the former yielding more than 60 per cent of the world's output. In 1913 France led.

ANTIMONY

Bibliography: State Mineralogist Reports VIII, X, XII–XV (inc.), XVII, XXII. Bulletins 38, 91.

Production of antimony in California has been irregular, and small in amount except during 1915–17 when the high war-time prices permitted American producers, for a short period, to compete with Chinese

antimony. The principal commercial production of antimony in California has come from Kern, Inyo and San Benito counties, and other occurrences have been noted in Nevada, Riverside and Santa Clara counties. The commonest occurrence is in the form of the sulphide, stibnite; but in the Kernville and Havilah districts in Kern County there were notable deposits of the native metal, being among the few localities of the world where native antimony has been found. There was a small production reported from San Benito County and development work on properties both in Kern and San Benito counties.

California producers claim that they can not operate profitably unless the price of antimony be above 12 cents per pound. During most of 1925 and 1926 the price was up, at times as high as 23¢, and as a consequence there was some revival of antimony mining in California. Present New York quotations (August, 1928) are around 10¢ per pound for Chinese brands. China is the principal world source of antimony.

The antimony market (New York being the chief center) is recognized as one of the most unstable of the metal markets. As the world's requirements for antimony are comparatively small, the prices react sharply if an extra quantity of the metal be thrown onto the market, and the trade becomes so cautious that the market may disappear altogether, causing production to fall off rapidly.

Pure antimony metal and manufactured antimony compounds are of considerable importance as pigments in the ceramic industry. The most important use of the metal, commercially, is in various alloys, particularly type-metal (with tin and lead), babbitt (with tin and copper), and britannia metal (with tin and copper). An alloy of 6% antimony and 9.4% lead is being extensively used in making battery plates for storage batteries for automobiles, airplanes, and radio apparatus.

Antimony Production of California, by Years.

The production of antimony in California by years since 1887 has been as follows:

Year	Tons	Value	Year	Tons	Value
1887	75	$15,500	1901	50	$8,350
1888	100	20,000	1902		
1889			1915	510	35,666
1893	50	2,250	1916	1,015	64,793
1894	150	6,000	1917	158	18,786
1895	33	1,485	1918		
1896	17	2,320	1925	*26	770
1897	20	3,500	1926		
1898	40	1,200	1927	*	
1899	75	13,500			
1900	70	5,700	Totals	2,389	$199,820

*Annual details concealed under 'Unapportioned.'

ARSENIC

Bibliography: Report XVIII. Bulletin 67. U. S. G. S., Min. Res. of U. S.

Arsenic is found in a number of localities in California in the mineral arsenopyrite (FeAsS), which is frequently gold bearing; and in scoro-

dite ($FeAsO_4+2H_2O$), an oxidation product of arsenopyrite. The occurrence of realgar (AsS) has also been noted. The principal source of the arsenic of commerce in the United States has been as a by-product from the metallurgical treatment of copper, gold, and lead ores. It is usually recovered in the form of the tri-oxide, or 'white arsenic,' for which there is a demand for the preparation of insecticides, for use in agriculture and horticulture, and especially against the cotton-boll weevil in the southern states.

Except for a small output in 1924, there has been no commercial recovery of arsenic from Californian ores. There having been only a single operator, the figures are concealed under the 'Unapportioned' item.

BERYLLIUM

Bibliography: Eng. & Min. Jour.-Press, Vol. 118, No. 8, p. 285, Aug. 23, 1924.

Beryllium is a metal resembling aluminum closely in its chemical character, and has a specific gravity of 1.85. Several alloys have been prepared experimentally, of which copper-beryllium has received the most attention. The addition of 5% beryllium produces a golden-yellow alloy. The compounds of beryllium at present used commercially are the nitrate and oxide. The nitrate is used by incandescent mantle manufacturers to harden the thorium oxide skeleton, and the oxide has been added to materials being used for the manufacture of abrasive compounds and in dental cements. Beryllium sulphate has been used to some extent in medical research.

There are a number of beryllium minerals, but none have been found in commercial quantities, except beryl, which is a beryllium-aluminum silicate. The chief use at present for ground beryl is as an addition to porcelain products, where it reduces the coefficient of expansion Beryllium metal is difficult to separate from aluminum.

Beryl occurs in California in the pegmatite dikes of the tourmaline gem district in northern San Diego and southwestern Riverside counties. Thus far there have been no commercial shipments of beryl except for gem purposes (the pink and aquamarine varieties).

BISMUTH

Bibliography: Bulletins 38, 67, 91. Am. Jour. Sci., 1903, Vol. 16.

Several bismuth minerals have been found in California, notably native bismuth and bismite (the ochre) in the tourmaline gem district in San Diego and Riverside counties, near Pala. Other occurrences of bismuth minerals, including the sulphide, bismuthinite, have been noted in Inyo, Fresno, Nevada, Tuolumne, San Bernardino, and Mono counties, but only in small quantities. The only commercial production recorded was 20 tons valued at $2,400, in 1904, and credited to Riverside County. Recovery of bismuth from blister copper in the electrolytic refinery has been noted. In the United States, the principal recovery of bismuth is obtained as a by-product from the refining of lead bullion.

The uses of bismuth are somewhat restricted, being employed principally in the preparation of medicinal salts, and in low melting-point

or cliché alloys. These alloys are utilized in automatic fire sprinkler systems, in electrical fuses, and in solders.

Present quotations for bismuth are around $1.85 per pound for the refined metal.

CADMIUM

Bibliography: U. S. Geol. Surv., Min. Res. of U. S., 1908, 1918.

During 1917 and 1918, cadmium metal was recovered by the electrolytic zinc plant of the Mammoth Copper Company in Shasta County. It was shipped in the form of 'sticks' and amounted to a total of several thousand pounds for the two years, the exact figures being concealed under 'Unapportioned.' That was the first, and thus far the only, commercial production of cadmium recorded from Californian ore. Cadmium occurs there associated with zinc sulphide, sphalerite. Cadmium also occurs in the Cerro Gordo Mine, Inyo County, associated with smithsonite (zinc carbonate).

There are several cadmium minerals, but none of them occur in sufficient quantities individually to be profitable as distinct ores. The cadmium of commerce is derived as a by-product in the reduction of zinc minerals and ores, in nearly all of which it occurs in at least minute proportions, the average ratio being about 1 of cadmium to 200 of zinc. As cadmium behaves metallurgically much the same as zinc, it constitutes a fraction of 1 per cent of nearly all metallic zinc.

Cadmium is produced in the United States in two forms—metallic cadmium and the pigment, cadmium sulphide. The principal use of the metal is in low-melting point, or cliché alloys, and its salts are utilized in the arts, medicine, and in electroplating. The sulphide is employed as a paint pigment, being a strong yellow, which is unaffected by hydrogen sulphide gas from coal smoke. It is also employed in coloring glass and porcelain. Cadmium cliché metal is stated to be superior to the corresponding bismuth alloy, for making stereotype plates. Cadmium is also used in bronze telegraph and telephone wires, and gives some promise of being utilized in electroplating.

Present quotations for cadmium are 80¢ per pound for the refined metal.

COBALT

Bibliography: Report XIV. Bulletins 67, 91. U. S. G. S., Min. Res. of U. S., 1912, 1918

Occurrences of some of the cobalt minerals have been noted in several localities in California, but to date no commercial production has resulted. Some of the copper ores of the foothill copper belt in Mariposa and Madera counties have been found to contain cobalt up to 3%. The most notable occurrence thus far found in this state is in the Mar-John Mine near Sheep Ranch, Calaveras County. Lenses of smaltite ($CoAs_2$), have been uncovered in the vein, there, and several tons taken out in the course of development work; but as yet there have been no commercial shipments.

The most important use of cobalt is in the manufacture of the alloy, stellite, in which it is combined with chromium, for making high-speed lathe tools, and non-tarnishing cutlery and surgeons' appliances. The metal is also used in electroplating, similarly to nickel; and the oxide,

carbonate, chloride, sulphate and other salts are used in ceramics for coloring. Some of the organic salts of cobalt (acetate, resinate, oleate) are employed as 'driers' in paint and varnish.

The nominal quotation for cobalt is around $2.10 per pound for the refined metal.

COPPER

Bibliography: State Mineralogist Reports VIII-XXII (inc.). Bulletins 23, 50, 91.

Copper is second only to gold among the metals mined in California. The output for 1927 amounted to a total of 27,350,316 pounds of recoverable metal valued at $3,582,888, a decrease from the 1926 figures of 33,521,544 pounds and $4,693,014. The average price of copper for 1927 was 13.1¢ per pound against 14.0¢ in 1926.

As for several years past, Plumas County ranks first for 1927, with an output of 21,055,425 pounds; Shasta second with 4,524,906 pounds; and Trinity third with 770,882 pounds.

Distribution of the 1927 copper output by counties was as follows:

County	*Amount*	*Value*
Calaveras	750,909	$98,367
Inyo	30,010	3,931
Plumas	21,055,425	2,758,261
Riverside	19,201	2,515
San Bernardino	197,132	25,824
Shasta	4,524,906	592,763
Trinity	770,882	100,986
Amador, Butte, El Dorado, Imperial, Kern, Los Angeles, Mono, Napa, Nevada, San Luis Obispo, Sierra*	1,851	241
Totals	27,350,316	$3,582,888

* Combined to conceal output of a single operator in each.

Copper Production of the United States.

According to preliminary data issued by the U. S. Bureau of Mines,[1] the smelter production of primary copper from domestic sources during 1927 amounted to 1,684,040,983 pounds, an increase of approximately 3%. The value of smelter production increased approximately 9% in 1926. The average price of 2,836,000,000 pounds of copper delivered during the year, as reported to the Bureau of Mines by selling agencies, was 13.1¢ per pound.

"Refined Copper

"The total production of new refined copper in 1927 was 2,326,000,000 pounds, an increase of over 3,000,000 pounds over that in 1926.

"Primary and secondary copper produced by regular refining plants and imported, 1926–1927, in pounds:

"Primary:

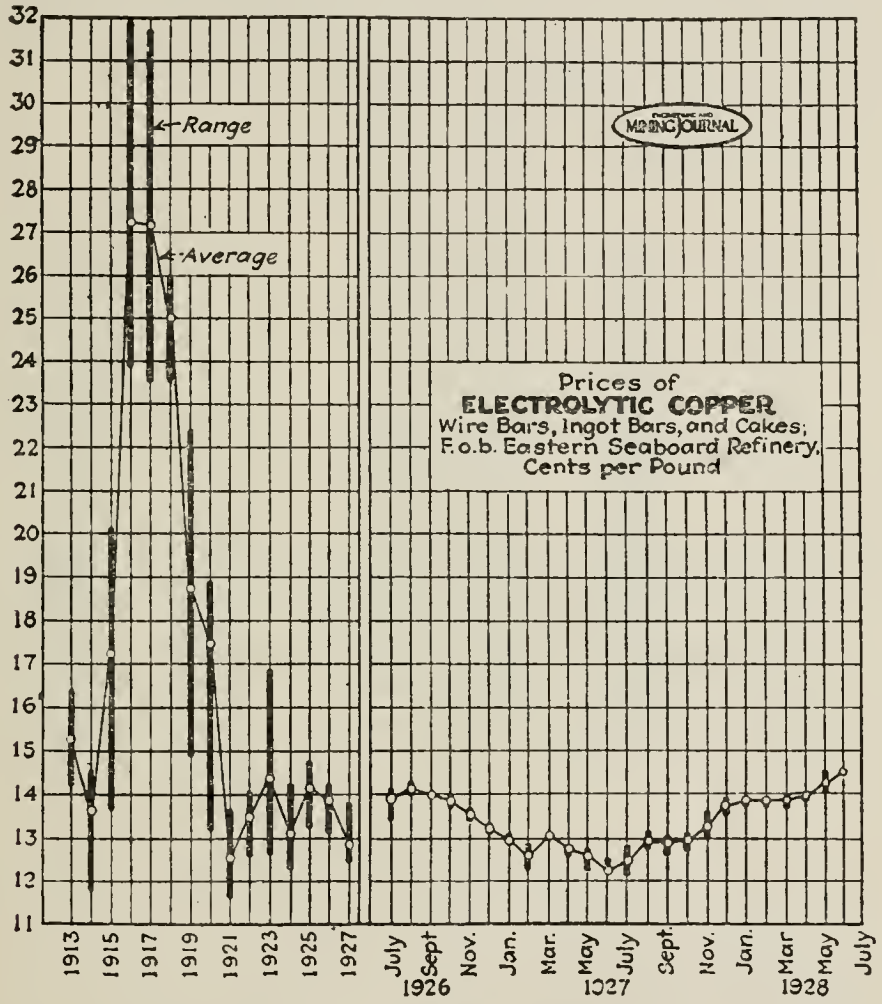
	1926	*1927*
Domestic:[a]		
Electrolytic	1,553,041,424	1,520,076,181
Lake	172,372,304	195,135,199
Casting	5,883,433	3,740,819
	1,731,297,161	1,718,952,199
Foreign:[a]		
Electrolytic	588,932,788	605,748,329
Casting	2,255,427	1,063,181
Refinery production of new coppper	2,322,485,376	2,325,763,709
Imports of refined copper	170,565,766	103,279,082
Total new refined copper made available	2,493,051,142	2,429,042,791

[1] U. S. Bureau of Mines, Press Bulletin, June 19, 1928.

	1926	1927
Secondary:		
Electrolytic	163,061,465	168,766,566
Casting	62,056,941	41,102,000
	225,118,406	209,868,566
	2,718,169,548	2,638,911,357

a "The separation of refined copper into metal of domestic and foreign origin is only approximate, as an accurate separation of the amounts at this stage of manufacture is not possible.

"In addition to their output of metallic copper the regular refining companies produced bluestone (hydrous copper sulphate) having a copper content of 9,180,000 pounds, as compared with 8,498,000 pounds in 1926.



From the *Engineering and Mining Journal*, July 14, 1928.

"Stocks

"Stocks of Copper January 1, 1923, 1924, 1925, 1926, 1927, and 1928, in Pounds

Year	*Refined copper*	*Blister and material in process of refining* [a]
1923	216,000,000	361,000,000
1924	264,000,000	432,000,000
1925	243,000,000	393,000,000
1926	124,000,000	432,000,000
1927	146,000,000	455,000,000
1928	171,000,000	401,000,000

a "The amounts stated in the last column in the table above do not include copper in stock at foreign smelters or in transit from foreign smelters to refineries in the United States."

Copper Production of California by Years.

Although some mining of copper ores in a small way had been done earlier, shipments in appreciable quantities began in 1861 and con-

tinued of importance up to the end of 1867, when a total of 68,631 tons (of 2376 pounds) of high-grade ores, and 847 tons of matte or 'regulus'[1] had been shipped to smelters at New York, Boston, and Swansea, Wales. The most important district at that time was Copperopolis and vicinity in Calaveras County, with some shipments also made from Mariposa, El Dorado, Fresno, and San Luis Obispo counties. From 1868 to 1882, the output was insignificant. There are wide discrepancies in the figures currently recorded for copper production previous to 1882 in which year the data of the U. S. Geological Survey began. The detailed statistics of the California State Mining Bureau began in the year 1894.

Amount and value of copper production in California annually since 1882 is given in the following tabulation:

Year	Pounds	Value	Year	Pounds	Value
1882	826,695	$144,672	1906	28,726,448	$5,522,712
1883	1,600,862	265,743	1907	32,602,945	6,341,387
1884	876,166	120,911	1908	40,868,772	5,350,777
1885	469,028	49,248	1909	65,727,736	8,478,142
1886	430,210	43,021	1910	53,721,032	6,680,641
1887	1,600,000	192,000	1911	36,838,021	4,604,753
1888	1,570,021	235,303	1912	34,169,997	5,638,049
1889	151,505	18,180	1913	34,471,118	5,343,023
1890	23,347	3,502	1914	30,491,535	4,055,375
1891	3,397,405	424,675	1915	40,968,966	7,169,567
1892	2,980,944	342,808	1916	55,809,019	13,729,017
1893	239,682	21,571	1917	48,534,611	13,249,948
1894	738,594	72,486	1918	47,793,046	11,805,883
1895	225,650	21,901	1919	22,162,605	4,122,246
1896	1,992,844	199,519	1920	12,947,299	2,382,303
1897	13,638,626	1,510,666	1921	12,088,053	1,559,358
1898	21,543,229	2,475,168	1922	22,883,987	3,090,582
1899	23,915,486	3,990,534	1923	28,346,860	4,166,989
1900	29,515,512	4,748,242	1924	52,089,349	6,823,704
1901	34,931,788	5,501,782	1925	46,968,499	6,669,527
1902	27,860,162	3,239,975	1926	33,521,544	4,693,014
1903	19,113,861	2,520,997	1927	27,350,316	3,582,888
1904	29,974,154	3,969,995			
1905	16,997,489	2,650,605	Totals	1,043,695,021	$167,853,389

GOLD

Bibliography: State Mineralogist Reports I to XXIII (inc.), (except III and VIII). Bulletins 36, 45, 57, 91, 92, 95. U. S. Geol. Surv., Prof. Paper 73.

Gold was the first, and, for many years, the most important single mineral product of California. Although now surpassed for a number of years in annual value by petroleum, and by cement beginning with 1920, it still heads our metal list, and California continues to outrank all the other gold-producing states of the United States, including Alaska. In fact, at present, California is producing approximately 26% of the gold mined in the entire United States.

While there is some renewal of activity in the development of gold placer properties, it has not yet become reflected in an increased yield of the metal. In fact, the 1927 figures show a decrease from the 1926 values.

The gold yield has decreased in recent years, not only in California but in the country as a whole. Meanwhile, the actual gold reserves (monetary stock on hand) of the United States has increased to such an extent that we now hold practically one-half of the world's stock.

[1] Brown, J. Ross, Mineral Resources West of the Rocky Mountains, p. 168, 1867.

The production of gold in California in 1927 totaled 564,585.50 fine ounces, worth $11,671,018, being a decrease of 12,212.90 fine ounces from the 1926 yield. The 'deep' or lode mines output accounted for $5,833,705, and the placers (mainly the dredges) produced $5,837,313. As the Division of Mines and Mining has never independently gathered the statistics of the gold and silver production, these figures, as in former years, are published by cooperation with and through the courtesy of Mr. J. M. Hill of the Division of Minerals and Statistics, U. S. Bureau of Mines.

Distribution of the 1927 gold production, by counties, was as follows:

Gold Production, by Counties, 1927

County	*Value*	*County*	*Value*
Alpine	$146	Napa	$7,235
Amador	1,922,714	Nevada	2,127,195
Butte	143,494	Placer	97,494
Calaveras	219,217	Plumas	321,016
Del Norte	384	Riverside	1,492
El Dorado	82,254	Sacramento	1,211,278
Fresno	17,406	San Bernardino	82,225
Humboldt	1,729	San Diego	11,490
Imperial	257	Shasta	191,900
Inyo	10,109	Sierra	678,873
Kern	171,100	Siskiyou	138,822
Lassen	531	Stanislaus	120,238
Los Angeles	2,345	Trinity	409,492
Madera	4,181	Tuolumne	40,209
Mariposa	183,805	Yuba	3,468,201
Mono	3,626		
Monterey	500	Total value	$11,671,018

The largest gold production for 1927 is reported from Yuba County with an output of 167,774.20 fine ounces ($3,468,201); Nevada County with 102,903.07 fine ounces ($2,127,195) second; Amador County with 93,011.27 fine ounces ($1,922,714) third; Sacramento County with 58,595.57 fine ounces, fourth; followed by Sierra and Trinity counties in fifth and sixth places, respectively. It will be noted as in 1926 Yuba County was the largest gold producer, with Nevada, Amador, and Sacramento following respectively in the same order. The Yuba and Sacramento production came almost entirely from dredges, while that from Nevada and Amador came mainly as lode gold.

The following is quoted from the advance chapter on Gold in 1927, by courtesy of Mr. J. M. Hill of the U. S. Bureau of Mines:

"The value of the mine production of gold in California in 1927 decreased $252,463, or 2 per cent, as compared with 1926. Lode mines yielded 50 per cent and placer mines 50 per cent of the total gold in 1927, as compared with 56 per cent and 44 per cent in 1926, 61 per cent and 39 per cent in 1925, and 65 per cent and 35 per cent, respectively, in 1924.

"Four counties produced more than $1,000,000 each in gold in 1927 as compared with four counties in 1926; Sierra County mines did not reach the million mark in gold value in either 1927 or 1926. Yuba, with $3,468,201, produced largely by dredges, was first in rank; Nevada, with $2,127,195, largely from gold lode mines, was second; Amador, with $1,922,714, almost entirely from gold lode mines, was third; and Sacramento, with $1,211,278, entirely from placers, mostly worked by dredges, was fourth. The fifth largest output of gold, $678,873, came from Sierra County, largely from gold lode mines, and was followed by Trinity County with $409,492, largely from dredge and hydraulic placer mines. Calaveras County, which was fifth in rank in 1926, dropped to eighth place in 1927, being preceded by Plumas County in its value of gold.

"The yield of gold from 465 placer mines in 1927 was valued at $5,837,313, an increase of 12 per cent as compared with the placer output from 483 mines in 1926. There was an increased gold yield of 10 per cent by dredges, 28 per cent by drift mines, 75 per cent by hydraulic, and 16 per cent by surface mines, respectively, as compared with 1926. In 1927 dredges yielded 94 per cent, drift mines 2 per cent, hydraulic mines 2 per cent, and surface workings 2 per cent of the gold from California placer deposits. Production of gold by 25 dredges operating in 1927 was $5,461,929, as compared with $4,950,545, by 23 dredges in 1926 and $4,750,842 by 24 dredges in 1925.

"The output of gold from 318 lode mines in California in 1927 was valued at $5,833,705, a decrease of 13 per cent as compared with 1926, following declines of 16 per cent in 1926 from 1925 and 7 per cent in 1925 from 1924.

"Gold ore and tailings treated in 1927 yielded 93 per cent, copper ore and tailings yielded 6 per cent, and silver ore and tailings yielded 1 per cent of the total gold from lode mines. Amalgamation mills in 1927 recovered approximately 75 per cent, cyanidation plants 15 per cent, and smelters 10 per cent of the gold lode output of California, as compared with 75 per cent, 17 per cent, and 8 per cent, respectively, in 1926.

"It is estimated that approximately 4 per cent of the gold output from lode mines was stolen and sold by 'high graders' in 1927, a reduction of 2 per cent over each of the two preceding years.

"In 1927 there were 33 companies in the state that produced more than 1000 ounces of gold each, and they contributed 91 per cent of the total gold output of the state. This is a decrease of 1 per cent from the 34 companies that produced more than 1000 ounces each in 1926. Of the 33 larger companies 7 produced more than 20,000 ounces each and 2 more than 50,000 ounces; 11 of them operated 22 gold dredges, 2 drift placer mines, 1 a silver mine, 3 operated copper mines, and 16 operated gold lode mines. The 10 largest gold-producing companies in California in 1927, in order of output, were the Yuba Consolidated Gold Fields (6 dredges), Natomas Company of California (6 dredges), Empire Mines Company (gold lode), Kennedy Mining and Milling Company (gold lode), North Star Mines Company (gold lode), Original Sixteen to One Mine (Inc.) (gold lode), Argonaut Mining Company (gold lode), Central Eureka Mining Company (gold lode), Walker Mining Company (copper mine), and the Original Mining and Milling Company (gold lode)."

Total Gold Production of California.

The presence of gold in stream gravels near Los Angeles was known and worked in a small way by the Indians, at least as early as 1841,[1] and possibly 1820.[2] On March 2, 1844, Don Manuel Castanares, deputy for California to the Congress of Mexico, reported[3] to his government that placers near Los Angeles had produced up to December, 1843, a total of 2000 ounces of gold dust, most of which had been sent to the United States mint at Philadelphia.

As the padres and the rancheros discouraged the quest of gold this early, small production caused no particular excitement. It was not until James W. Marshall's finding of gold nuggets in the tail-race of Sutter's saw mill on the American River, January 24, 1848, was heralded abroad that the great rush began, and California became a commonwealth of first rank almost over night. There are, however, no authentic data on gold production prior to 1848, other than occasional, scattered references such as above quoted.

The following table was originally compiled by Chas. G. Yale, of the Division of Mineral Resources, U. S. Geological Survey, but for a number of years statistician of the California State Mining Bureau and the U. S. Mint at San Francisco. The authorities chosen for certain periods were: J. D. Whitney, state geologist of California; John Arthur Phillips, author of "Mining and Metallurgy of Gold and Silver" (1867); U. S. Mining Commissioner R. W. Raymond; U. S. Mining Commissioner J. Ross Browne; Wm. P. Blake, Commissioner from California to the Paris Exposition, where he made a report on "Precious Metals" (1867); John J. Valentine, author for many years of the annual report on precious metals published by Wells, Fargo & Company's Express; and Louis A. Garnett, in the early days manager of the San Francisco refinery, where records of gold receipts and shipments were kept. Mr. Yale obtained other data from the reports of the director of the U. S. Mint and the director of the U. S. Geological Survey. The authorities referred to, who were alive at the time of the original compilation of this table in 1894, were all consulted in person or by letter by Mr. Yale with reference to the correctness of their published data, and the final table quoted was then made up.

[1] Hittell, T. H., History of California: Vol. II, p. 312, 1885.
[2] Bancroft, H. H., History of California: Vol. II, p. 417, 1886.
[3] Mercantile Trust Review of the Pacific, Vol. XIV, No. 2, p. 43, Feb. 15, 1925.

The figures for 1903–1923 (inclusive), are those prepared by the U. S. Geological Survey; and since by the U. S. Bureau of Mines:

Year	Value	Year	Value
1848	$245,301	1889	$11,212,913
1849	10,151,360	1890	12,309,793
1850	41,273,106	1891	12,728,869
1851	75,938,232	1892	12,571,900
1852	81,294,700	1893	12,538,780
1853	67,613,487	1894	13,863,282
1854	69,433,931	1895	15,334,317
1855	55,485,395	1896	17,181,562
1856	57,509,411	1897	15,871,401
1857	43,628,172	1898	15,906,478
1858	46,591,140	1899	15,336,031
1859	45,846,599	1900	15,863,355
1860	44,095,163	1901	16,989,044
1861	41,884,995	1902	16,910,320
1862	38,854,668	1903	16,300,653
1863	23,501,736	1904	18,633,676
1864	24,071,423	1905	18,898,545
1865	17,930,858	1906	18,732,452
1866	17,123,867	1907	16,727,928
1867	18,265,452	1908	18,761,559
1868	17,555,867	1909	20,237,870
1869	18,229,044	1910	19,715,440
1870	17,458,133	1911	19,738,908
1871	17,477,885	1912	19,713,478
1872	15,482,194	1913	20,406,958
1873	15,019,210	1914	20,653,496
1874	17,264,836	1915	22,442,296
1875	16,876,009	1916	21,410,741
1876	15,610,723	1917	20,087,504
1877	16,501,268	1918	16,528,953
1878	18,839,141	1919	16,695,955
1879	19,626,654	1920	14,311,043
1880	20,030,761	1921	15,704,822
1881	19,223,155	1922	14,670,346
1882	17,146,416	1923	13,379,013
1883	24,316,873	1924	13,150,175
1884	13,600,000	1925	13,065,330
1885	12,661,044	1926	11,923,481
1886	14,716,506	1927	11,671,018
1887	13.588,614		
1888	12,750,000	Total value	$1,812,893,014

IRIDIUM (see under Platinum)

IRON ORE

Bibliography: State Mineralogist Reports II, IV, V, X, XII–XV (inc.), XVII, XVIII, XXI, XXII, XXIII. Bulletins 38, 67, 91. Am. Inst. Min. Eng., Trans. LIII. Min. & Sci. Press, Vol. 115, pp. 112, 117–122; Vol. 123, pp. 94–96, 113–114.

A small tonnage of iron ore (magnetite) was produced in California during the year 1927, from beach sand, and utilized for foundry flux and in steel refining at open-hearth plants. As there was only a single operator, the figures are concealed under the 'unapportioned' total. There is also some tonnage utilized in the manufacture of paint pigment, and which is credited to 'mineral paint' in these statistical reports.

There are considerable deposits of iron ore known in California, notably in Shasta, Madera, Placer, Riverside, San Bernardino and Los Angeles counties, but production has so far been limited for lack of an economic supply of coking coal. Some pig-iron has been made, utilizing charcoal for fuel, both in blast furnaces and by electrical reduction; also, ferrochrome, ferromanganese, and ferrosilicon have been made in California.

Total Iron Ore Production of California.

Total iron ore production in California, with annual amounts and values, is as follows:

Year	Tons	Value	Year	Tons	Value
1881*	9,273	$79,452	1914	1,436	$5,128
1882	2,073	17,766	1915	724	2,584
1883	11,191	106,540	1916	3,000	6,000
1884	4,532	40,983	1917	2,874	11,496
1885			1918	3,108	15,947
1886	3,676	19,250	1919	2,300	13,796
1887			1920	5,975	40,889
1893	250	2,000	1921	1,970	12,030
1894	200	1,500	1922	3,588	18,868
1895			1923	3,102	18,665
1907	400	400	1924 } [a] 1925 }	785	4,710
1908					
1909	108	174	1926 } [a] 1927 }	5,272	26,000
1910	579	900			
1911	558	558			
1912	2,508	2,508	Totals	71,805	$552,629
1913	2,343	4,485			

*Productions for the year 1881-1886 (inc.) were reported as "tons of pig iron" (U. S. G. S., Min. Res. 1885), and for the table herewith are calculated to "tons of ore" on the basis of 47.6% Fe as shown by an average of analyses of the ores (State Mineralogist Report IV, p. 242). This early production of pig iron was from the blast furnaces then in operation at Hotaling in Placer County. Charcoal was used in lieu of coke. Though producing a superior grade of metal, they were obliged finally to close down, as they could not compete with the cheaper English and eastern United States iron brought in by sea to San Francisco.

[a] Annual details concealed under 'Unapportioned.'

LEAD

Bibliography: State Mineralogist Reports IV, VIII–XV (inc.), XVII–XXII (inc.).

The production of lead in California in 1927 was 2,748,440 pounds of recoverable metal valued at $173,235, as against the production of 1926 of 8,067,873 pounds valued at $645,429. The average price of lead in 1927 was 6.3¢ a pound against 8.0¢ in 1926 and 8.7¢ in 1925.

As in the past the principal output of lead was from the lead-silver ores of Inyo County.

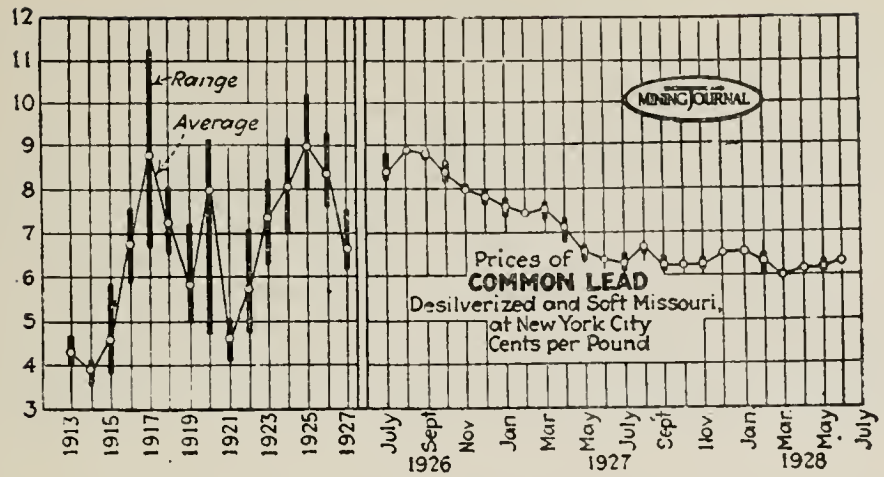
Lead Production by Counties for 1927

County	*Pounds*	*Value*
Amador	2,491	$157
Calaveras	4,606	290
Inyo	2,173,032	136,901
Los Angeles	312,645	19,697
Mono	4,830	304
Riverside	121,667	7,665
San Bernardino	125,692	7,919
Shasta	1,780	112
Butte, Nevada, Plumas*	1,691	106
Totals	2,748,440	$173,151

* Combined to conceal output of a single operator in each.

In 1927 the production of primary lead in the United States was 668,320 short tons valued at $84,210,000, as shown by report of the United States Bureau of Mines,[1] this being a decline from the national production of 1926 of 680,685 short tons valued at $108,910,000, due to a decline in the average selling price of lead from 8.0¢ to 6.7¢.

[1] U. S. Bureau of Mines, Mineral Resources of the United States (Preliminary Summary).



From *Engineering and Mining Journal*, July 14, 1928.

Lead Production of California, by Years.

Statistics on lead production in California were first compiled by this Bureau in 1887. Amount and value of the output, annually, with total figures, to date, are given in the following table:

Year	Pounds	Value	Year	Pounds	Value
1887	1,160,000	$52,200	1909	2,685,477	$144,897
1888	900,000	38,250	1910	3,016,902	134,082
1889	940,000	35,720	1911	1,403,839	63,173
1890	800,000	36,000	1912	1,370,067	61,653
1891	1,140,000	49,020	1913	3,640,951	160,202
1892	1,360,000	54,400	1914	4,697,400	183,198
1893	666,000	24,975	1915	4,796,299	225,426
1894	950,000	28,500	1916	12,392,031	855,049
1895	1,592,400	49,364	1917	21,651,352	1,862,016
1896	1,293,500	38,805	1918	13,464,869	956,006
1897	596,000	20,264	1919	4,139,562	219,397
1898	655,000	23,907	1920	4,903,738	392,300
1899	721,000	30,642	1921	1,149,051	51,707
1900	1,040,000	41,600	1922	6,511,280	358,120
1901	720,500	28,820	1923	9,934,522	695,416
1902	349,440	12,230	1924	4,984,387	398,751
1903	110,000	3,960	1925	7,352,422	639,661
1904	124,000	5,270	1926	8,067,873	645,429
1905	533,680	25,083	1927	2,748,440	173,151
1906	338,718	19,307			
1907	328,681	16,690	Totals	136,353,864	$8,901,304
1908	1,124,483	46,663			

MANGANESE

Bibliography: State Mineralogist Reports XII–XV (inc.), XVIII, XXII. Bulletins 38, 67, 76, 91. U. S. G. S., Bull. 427. Eng. & Min. Jour.-Press, Vol. 117, p. 545.

Small amounts of manganase ore from California have been shipped in past years to steel plants along the Pacific Coast. These ores showed analyses of from 45% to 55% Mn and were utilized by plants for ferromanganese.

Importations of foreign manganese ores to the United States in 1927, mainly from Brazil, amounted to a total of 622,067 long tons valued at 8,487,016, compared with 368,341 tons and $11,075,771 in 1926. The Tariff Act of 1922 provides for an import duty of 1¢ per pound on the metallic manganese contained, for "manganese ore or concen-

trates containing in excess of 30 per centum of metallic manganese." The bulk of such ore is consumed in the large steel-producing centers of the eastern United States.

Much valuable research work has been done in recent years, particularly by companies operating in Montana and Virginia, in the beneficiation of manganese ores. The success of their processes appears assured. In reply to the recent suggestion of certain steel interests to have the manganese import duty removed, the manganese operators have organized the American Manganese Producers' Association, which will work for retention of the tariff. Such retention will enable the domestic industry to grow and to further develop ore-dressing methods that will make available large tonnages of low-grade material not now marketable.

Manganese Ore Production in California, by Years.

Production of manganese ore in California began at the Ladd Mine, San Joaquin County, in the Tesla District in 1867. When shipments of this ore to England ceased late in 1874, upwards of 5000 tons had been produced by that property. For some years following that, the output was small. The tabulation herewith shows California's output of manganese ore, annually, since 1887, when the compilation of such figures was begun by the State Mining Bureau:

Year	Tons	Value	Year	Tons	Value
1887	1,000	$9,000	1909	3	$75
1888	1,500	13,500	1910	265	4,235
1889	53	901	1911	2	40
1890	386	3,176	1912	22	400
1891	705	3,830	1913		
1892	300	3,000	1914	150	1,500
1893	270	4,050	1915	4,013	49,098
1894	523	5,512	1916	13,404	274,601
1895	880	8,200	1917	15,515	396,659
1896	518	3,415	1918	26,075	979,235
1897	504	4,080	1919	11,569	451,422
1898	440	2,102	1920	2,892	62,323
1899	295	3,165	1921	1,005	12,210
1900	131	1,310	1922	540	7,650
1901	425	4,405	1923	690	10,620
1902	870	7,140	1924	1,115	25,785
1903	1	25	1925	832	19,450
1904	60	900	1926	235	4,700
1905			1927		
1906	1	30			
1907	1	25	Totals	87,511	$2,383,554
1098	321	5,785			

MOLYBDENUM

Bibliography: State Mineralogist Reports XIV, XVII. Bulletins 67, 91. U. S. Bur. of Min., Bulletin 111. Proc. Colo. Sci. Soc., Vol. XI.

Molybdenum is used as an alloy constituent in the steel industry, and in certain forms of electrical apparatus. Included in the latter is its successful substitution for platinum and platinum-iridium in electric contact-making and -breaking devices. In alloys it is used similarly to and in conjunction with chromium, cobalt, iron, manganese, nickel, tungsten, and vanadium. The oxides and the ammonium salt have important chemical uses.

The two principal molybdenum minerals are: the sulphide, molybdenite; and wulfenite, lead molybdate; the former furnishing practically the entire commercial output. Molybdenite is found in or associated with acidic igneous rocks, such as granite and pegmatite. The chief commercial sources have been New South Wales, Queensland and Norway, with some also from Canada; but the United States is now able to supply its own requirements.

The growing consumption of molybdenum by alloy-steel makers in the United States has been stimulated by the fact that molybdenum alone of the steel-alloying metals can be produced commercially in the United States to an extent which avoids all necessity for importation. Another fact has been the marked adaptability of molybdenum steels to large-scale production of automobile and other parts.

The most important development of 1924–1925 was the elimination of ferromolybdenum from the market due to the substitution of calcium molybdate as the furnace addition by the entire alloy-steel industry. Calcium molybdate is stated to be not only easier and less costly to prepare, but it introduces the molybdenum into the steel bath in a much purer form, the resulting steel being superior to that made with ferromolybdenum.

Deposits of disseminated molybdenite are known in several localities in California, and in at least two places it occurs in small masses associated with copper sulphides. The only recorded commercial shipments of molybdenum ore in California were during the war, 1916–1918. Some development work has been recently done on a high-grade deposit at the head of the Kaweah River, Tulare County.

The present quotations on ferromolybdenum are $1.20 per pound Mo f. o. b. shipping point 50%—60% Mo.

Molybdenum Production of California, by Years.

California's production of molybdenum ore by years is summarized in the following tabulation:

Year	*Tons*	*Value*
1916	8	$9,945
1917	243	9,014
1918	*	300
Totals	251	$19,259

* 300 pounds of 90% MoS_2, concentrate.

NICKEL

Bibliography: State Mineralogist Reports XIV, XVII, U. S. G. S., Bulletin 640–D. U. S. Bureau of Standards, Circular 100.

Nickel occurs in the Friday Copper Mine in the Julian District, San Diego County. The ore is a nickel-bearing pyrrhotite, with some associated chalcopyrite. Some ore has been mined in the course of development work, but not treated nor disposed of, as they were unable to get any smelter to handle it for them. Nickel ore has also been reported from other localities in California, but not yet confirmed.

Present quotations for nickel are around 35¢–37¢ per pound for the refined metal.

OSMIUM (see under Platinum)

PALLADIUM (see under Platinum)

PLATINUM

Bibliography: State Mineralogist Reports IV, VIII, IX, XII–XVIII. Bulletins 38, 45, 67, 85, 91, 92. U. S. Geol. Surv. Bulletins 193, 285. Trans. Am. Ins. Min. Eng., Vol. 47, pp. 217–218.

In California the platinum group metals are obtained as a by-product from placer operations for gold. The major portion of it comes from the dredges working in Butte, Sacramento, Stanislaus and Shasta counties, with a small amount coming from the hydraulic and surface-sluicing mines of Del Norte, Humboldt, Siskiyou, and Trinity counties.

The production of platinum metals in California for 1927 totaled 183 ounces crude, containing 139 fine ounces valued at $10,757, compared with the 1926 figures of 322 fine ounces and $32,005. Of this amount 102 fine ounces or 73% came from the gold dredges.

In addition to the above metal there was some platinum mined but not sold in 1927 in Butte, Trinity and Yuba counties.

Of the above 183 fine ounces at least 37 fine ounces were iridium, osmium, palladium and ruthenium. Most of the platinum refiners pay for the osmiridium on the basis of its iridium content. Crude 'platinum' is really a mixture of the metals of that group, and carries varying percentages of platinum, iridium, osmiridium or iridosmine, with occasionally some ruthenium and palladium. In addition to the above-noted production, there is usually some platinum recovered as a by-product in the gold refinery of the mint, but which can not be assigned to the territory of its origin for lack of knowing to which lots of gold it belongs. Some platinum and palladium are also recovered in the electrolytic refining of blister copper.

For 1926, the distribution by counties of California's platinum yield was as follows:

County	*Fine ounces*	*Value*
Butte [a]	7	$499
Shasta [a]	26	2,552
Siskiyou	9	690
Del Norte, Humboldt, Sacramento,[b] Stanislaus,[a] and Trinity*	97	7,018
Totals	139	$10,749

* Combined to conceal output of a single operator in each.
[a] Includes iridium and osmium.
[b] Includes iridium, osmium, palladium and ruthenium.

Uses, Markets, and Consumption.

Besides its well-known uses in jewelry, dentistry and for chemicalware, an important industrial development of recent years employs platinum as a catalyzer in the 'contact process' of manufacturing concentrated sulphuric acid. It is also necessary for certain delicate parts of the ignition systems in automobiles, motor boats and aeroplanes. Experiments have been made to find alloys which can replace platinum for dishes and crucibles in analytical work, but so far with only slight success.

According to Hill,[1] the total consumption of platinum metals in the United States in 1927 was 149,686 troy ounces, a decrease from that consumed in 1926, distributed as follows:

[1] Hill, J. M., Platinum and Allied Metals in 1927; U. S. Bur. of Mines, Bull., June 2, 1928.

"Platinum metals consumed in the United States as reported by refiners, 1926 and 1927, by industries, in troy ounces:

1926	*Platinum*	*Iridium*	*Palladium*	*Others*	*Total*	*Percentage of total*
Chemical	10,253	145	213	228	10,839	6
Electrical	16,765	1,608	3,508	185	22,066	13
Dental	8,542	131	11,063	---	19,736	11
Jewelry	85,908	2,949	7,770	454	97,081	57
Miscellaneous	17,381	581	2,181	1,751	21,894	13
Totals	138,849	5,414	24,735	2,618	171,616	100
1927						
Chemical	11,010	101	180	175	11,466	8
Electrical	14,905	1,618	2,491	121	19,135	13
Dental	7,504	153	12,194	---	19,851	13
Jewelry	86,036	4,059	3,706	329	94,130	63
Miscellaneous	3,176	305	312	1,311	5,104	3
Totals	122,631	6,236	18,883	1,936	149,686	100

"Stocks

"At the end of 1927 stocks of platinum metals in the hands of refiners were 102,056 ounces, a decrease of 3 per cent as compared with stocks at the end of 1926.

"Stocks of platinum metals in the hands of refiners in the United States, December 31, 1918–1927, in troy ounces:

Year	*Platinum*	*Iridium*	*Palladium*	*Others*	*Total*
1918	51,504	3,224	10,086	---	64,814
1919	29,228	3,359	10,235	610	43,432
1920	46,747	4,196	16,565	216	67,724
1921	38,514	4,991	21,042	3,113	67,660
1922	41,900	7,559	24,975	1,583	76,017
1923	36,554	5,208	26,266	2,697	70,725
1924	40,464	3,622	27,400	3,053	74,539
1925	44,024	3,720	26,740	4,609	79,093
1926	64,203	3,933	31,950	5,485	105,571
1927	68,757	4,617	24,313	4,369	102,056

Prices.

The prices of all the metals of the platinum group fluctuated considerably during 1927, dropping in June, when they reached their low point. The price of pure platinum per fine ounce was $105 in January, 1927, dropping to $62 in June and ending the year at $72. Palladium ended the year at $49 to $50, iridium at $175 to $185. In April there was a rumor that Russian platinum would be sold through Amtorg Company, which sent the market price down. There were also large shipments from Colombia.

Platinum Production of California, by Years.

The annual production and values since 1887, have been as follows:

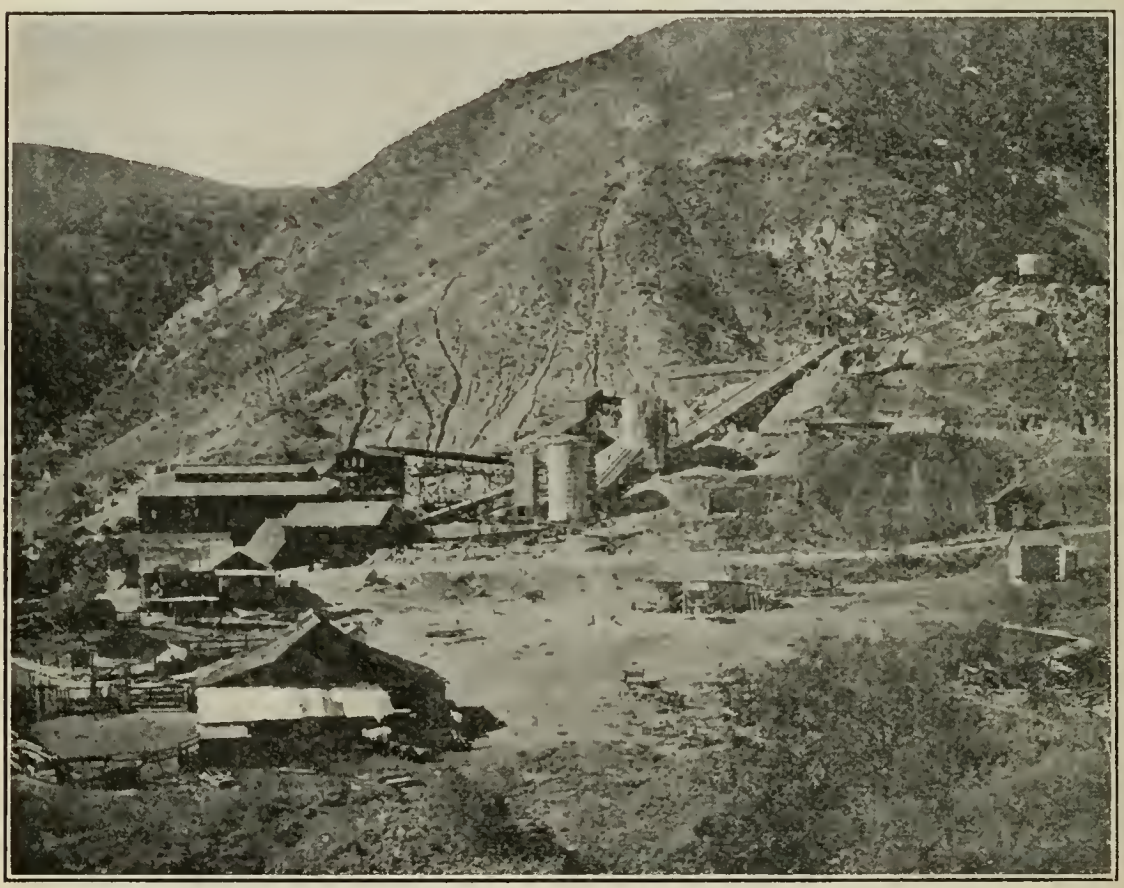
Year	Ounces	Value	Year	Ounces	Value
1887	100	$400	1909	416	$10,400
1888	500	2,000	1910	337	8,386
1889	500	2,000	1911	511	14,873
1890	600	2,500	1912	603	19,731
1891	100	500	1913	368	17,738
1892	80	440	1914	463	14,816
1893	75	517	1915	667	21,149
1894	100	600	1916	886	42,642
1895	150	900	1917	610	43,719
1896	162	944	1918	571	42 788
1897	150	900	1919	*418	60 611
1898	300	1,800	1920	477	68,977
1899	300	1,800	1921	613	58,754
1900	400	2,500	1922	795	90,288
1901	250	3,200	1923	602	78,546
1902	39	468	1924	273	36,452
1903	70	1,052	1925	292	39,937
1904	123	1,849	1926	322	32,005
1905	200	3,320	1927	139	10,749
1906	91	1,647			
1907	300	6,255	Totals	14,653	$761,567
1908	706	13,414			

* Fine ounces, beginning with 1919.

QUICKSILVER

Bibliography: State Mineralogist Reports IV, V, XII–XV, XVII–XXII (inc.). Bulletins 27, 78, 91. U. S. Geol. Surv., Monograph XIII. U. S. Bur. of Mines, Tech. Papers 96, 227; Bulletin 222.

The production of quicksilver for 1927 in California was 6488 flasks (of 75 pounds, avoirdupois) valued at $714,418. This was an increase in both quantity and value over the 1926 figure of 5892 flasks valued at $516,382. This production came from Lake, Monterey, Napa, Orange, San Benito, San Luis Obispo and Sonoma counties, the largest production coming from San Benito, with Napa in second place. The average price received during 1927, according to the producers'



New Idria Mine at Idria, San Benito County. This mine is the largest quicksilver producer in the United States. Photo by Walter W. Bradley.

reports to the Division of Mines and Mining, was $111.67 per flask, as against $89.64 in 1926, and the record average of $114.03 for the year 1918.

During 1927 there were sharp fluctuations of quotations on quicksilver. The year started at $100.33, going to $123.33 in April, and ending the year at $129.50. In June the price quoted changed from a 75-pound flask to a 76-pound flask.

The average quotations for quicksilver in 1927 were $117.25 for a 76-pound flask at San Francisco, or $115.71 (for 75 pounds), against $87.64 (75 pounds) in 1926. The average quotations for 1927 in New York were $118.16 for a 76-pound flask, or $116.60 for a 75-pound flask.

The U. S. Bureau of Mines reported the total production of the United States for 1927 at 11,276 flasks valued at $1,314,782 (using $116.60 as the average of New York quotations). Outside of California, the principal yield came from Texas and Washington, with a few flasks from Nevada, Alaska, Arizona, and Idaho. California production was approximately 53% of the total.

The imported quicksilver [1] in 1927 amounted to 24,650 flasks. Of these, 13,663 flasks came from Spain, 9089 flasks from Italy, and 1843 flasks from Mexico. The rise in price in the last quarter of 1926 and 1927 was due to an increased demand in the United States, as shown by the increased production and imports and the continued demand of continental Europe.

Uses.

The most important uses of quicksilver are the recovery of gold and silver by amalgamation, and in the manufacture of fulminate for explosive caps, of drugs, of electric appliances, and of scientific apparatus. By far the greatest consumption is in the manufacture of fulminate and drugs. Radio tubes and electrical appliances are taking increasing amounts.

Total Quicksilver Production of California.

Year	Flasks	Value	Average price per flask	Year	Flasks	Value	Average price per flask
1850	7,723	$768,052	$99 45	1890	22,926	$1,203,615	$52 50
1851	27,779	1,859,248	66 93	1891	22,904	1,036,406	45 25
1852	20,000	1,166,600	58 33	1892	27,993	1,139,595	40 71
1853	22,284	1,235,648	55 45	1893	30,164	1,108,527	36 75
1854	30,004	1,663,722	55 45	1894	30,416	934,000	30 70
1855	33,000	1,767,150	53 55	1895	36,104	1,337,131	37 04
1856	30,000	1,549,500	51 65	1896	30,765	1,075,449	34 96
1857	28,204	1,374,381	48 73	1897	26,691	993,445	37 28
1858	31,000	1,482,730	47 83	1898	31,092	1,188,626	38 23
1859	13,000	820,690	63 13	1899	29,454	1,405,045	47 70
1860	10,000	535,500	53 55	1900	26,317	1,182,786	44 94
1861	35,000	1,471,750	42 05	1901	26,720	1,285,014	48 46
1862	42,000	1,526,700	36 35	1902	29,552	1,276,524	43 20
1863	40,531	1,705,544	42 08	1903	32,091	1,335,954	42 25
1864	47,489	2,179,745	45 90	1904	*28,876	1,086,323	37 62
1865	53,000	2,432,700	45 90	1905	24,655	886,081	35 94
1866	46,550	2,473,202	53 13	1906	19,516	712,334	36 50
1867	47,000	2,157,300	45 90	1907	17,379	663,178	38 16
1868	47,728	2,190,715	45 90	1908	18,039	763,520	42 33
1869	33,811	1,551,925	45 90	1909	16,217	773,788	47 71
1870	30,077	1,725,818	57 38	1910	17,665	799,002	45 23
1871	31,686	1,999,387	63 10	1911	19,109	879,205	46 01
1872	31,621	2,084,773	65 93	1912	20,600	866,024	42 04
1873	27,642	2,220,482	80 33	1913	15,661	630,042	40 23
1874	27,756	2,919,376	105 18	1914	11,373	557,846	49 05
1875	50,250	4,228,538	84 15	1915	14,199	1,157,449	81 52
1876	75,074	3,303,256	44 00	1916	21,427	2,003,425	93 50
1877	79,396	2,961,471	37 30	1917	24,382	2,396,466	98 29
1878	63,880	2,101,652	32 90	1918	22,621	2,579,472	114 03
1879	73,684	2,194,674	29 85	1919	15,200	1,353,381	89 04
1880	59,926	1,857,706	31 00	1920	10,278	775,527	75 45
1881	60,851	1,815,185	29 83	1921	3,157	140,666	44 56
1882	52,732	1,488,624	28 23	1922	3,466	191,851	55 35
1883	46,725	1,343,344	28 75	1923	5,458	332,851	60 98
1884	31,913	973,347	30 50	1924	7,948	543,080	68 33
1885	32,073	986,245	30 75	1925	7,683	621,831	80 81
1886	29,981	1,064,326	35 50	1926	5,892	516,382	87 64
1887	33,760	1,430,749	42 38	1927	6,488	714,118	111 67
1888	33,250	1,413,125	42 50				
1889	26,464	1,190,880	45 00	Totals	2,225,919	$109,761,919	

*Flasks of 75 lbs. since June, 1904; of 76½ lbs. previously.

[1] U. S. Dept. of Comm. Press Bull., May 29, 1928.

Total amount and value of the quieksilver produetion of California, as given in available records, are shown in the preeeding tabulation. Though the New Almaden Mine in Santa Clara County was first worked in 1824, and has been in practieally continuous operation since 1846 (the yield being small the first two years), there are no available data on the output earlier than 1850. Previous to June, 1904, a 'flask' of quieksilver eontained 76½ pounds, but since that date 75 pounds. In compiling this table the following sourees of information were used: for 1850–1883, table by J. B. Randol, in Report of State Mineralogist, IV, p. 336; 1883–1893, U. S. Geologieal Survey reports; 1894 to date, statistieal bulletins of the State Mining Bureau; also State Mining Bureau, Bulletin 27, "Quicksilver Resourees of California," 1908, p. 10.

SILVER

Bibliography: State Mineralogist Reports IV, VIII, XII–XXIII (ine.). Bulletins 67, 91. Min. & Sei. Press, March 1, 1919.

Except for the early-day produetion from the silver mines of the Calieo district and the more reeent produetion from those of the Randsburg area, both of whieh are in San Bernardino County, the reeovery of silver in California has been largely as a by-product from its association with eopper, lead, zine, and gold ores.

In 1927 silver production of California totaled 1,620,242 fine ounces valued at $918,677, compared with 2,022,460 ounces values at $1,262,-015 in 1926. Of the 1927 yield 20,903 ounces valued at $11,852 came from placers. The average price of domestie silver during 1927 was 56.7¢ per ounce in New York against 62.4¢ in 1926.

The figures below are those of the U. S. Bureau of Mines, Department of Commerce (as explained under Gold).

The distribution of the 1927 silver yield, by counties, was as follows:

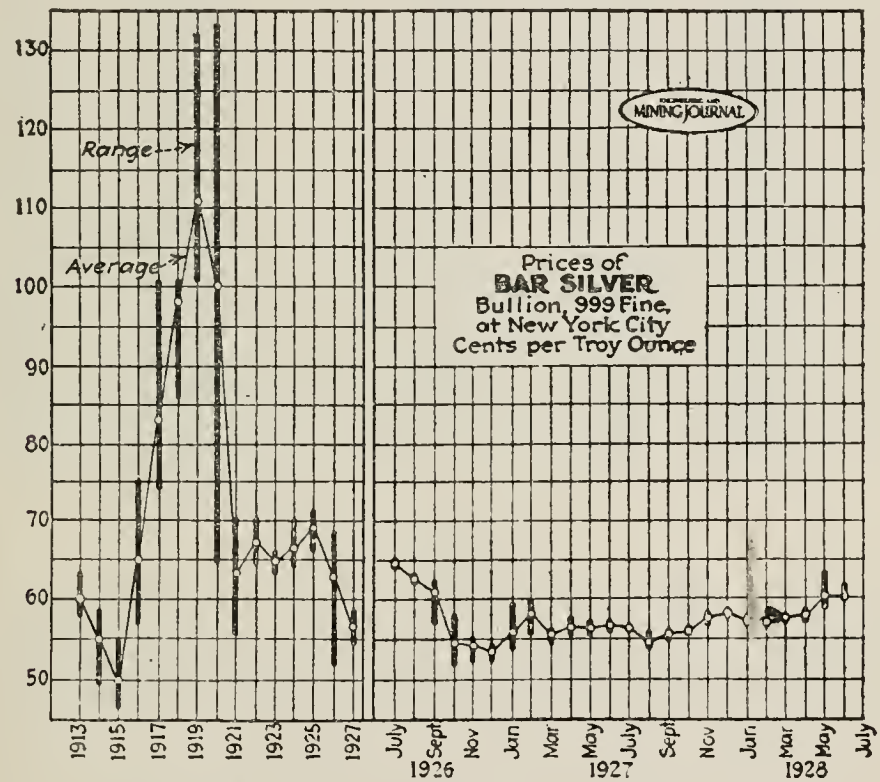
Silver Production by Counties

County	*Fine ounces*	*Value*
Alpine	105	$60
Amador	19,963	11,319
Butte	655	371
Calaveras	7,023	3,982
Del Norte	2	1
El Dorado	675	383
Fresno	136	77
Humboldt	25	14
Imperial	5	3
Inyo	83,570	47,384
Kern	15,753	8,932
Lassen	16	9
Los Angeles	26,135	14,819
Madera	67	38
Mariposa	2,427	1,376
Mono	38,487	21,822
Monterey	4	2
Napa	99,532	56,435
Nevada	48,644	27,581
Placer	776	440
Plumas	315,887	179,108
Riverside	3,385	1,919
Sacramento	2,596	1,472
San Bernardino	788,580	447,125
San Diego	162	92
Shasta	123,917	70,261
Sierra	5,909	3,350
Siskiyou	1,033	586
Stanislaus	608	345
Trinity	21,739	12,326
Tuolumne	533	302
Yuba	11,893	6,743
Totals	1,620,242	$918,677

The following paragraphs are quoted from the U. S. Bureau of Mines, Department of Commerce, Advance Chapter on Gold and Silver for 1927, by courtesy of Mr. J. M. Hill, statistician in charge of the San Francisco branch office:

"The mine production of silver in California in 1927 was 1,620,242 ounces, valued at $918,677, a decrease of 20 per cent in quantity and 27 per cent in value as compared with 1926. Three counties yielded more than 100,000 ounces of silver each in 1927, namely, San Bernardino County, with 788,580 ounces largely from silver ore produced by the California Rand Silver (Inc.); Plumas County, with 315,887 ounces, largely from copper ores of the Engels and Walker mines; Shasta County, with 123,917 ounces, largely from zinc and copper ores. Inyo and Mono counties were in the 100,000 ounce class in 1926, but each produced less than 100,000 ounces in 1927. The fourth largest producer of silver was Napa County, with 99,532 ounces from silver ores, and this was followed by Inyo County, with 83,570 ounces, mostly from lead ores.

"The yield of silver from placer mines in 1927 was 20,903 ounces, 8 per cent more than in 1926 and over 1 per cent of the total silver output of the state. Of the 1,599,339 ounces of silver produced at lode mines in 1927 silver ore and tailings yielded 58 per cent (same as in 1926), copper ore and tailings 25 per cent (20 per



From *Engineering and Mining Journal*, July 14, 1928.

cent in 1926), gold ore and tailings 6 per cent (5 per cent in 1926), lead ore and tailings 5 per cent (6 per cent in 1926), zinc ore 4 per cent (7 per cent in 1926), lead-zinc ore 2 per cent, and lead-copper ore less than one-fourth of 1 per cent.

"Each of 43 properties in 1927 produced more than 1000 ounces of silver as compared with 46 properties in 1926, and these mines yielded 98 per cent of the total silver produced in the state in both 1927 and 1926. At 27 properties the yield was between 1000 and 10,000 ounces (31 in 1926), at 13 between 10,000 and 100,000 (10 in 1926), at 2 between 100,000 and 300,000 (4 in 1926), and at 1 mine in excess of 700,000 ounces in 1927. No mine in California produced as much as 1,000,000 ounces of silver in 1927. The 10 largest producers of silver in California in 1927 in order of output were the California Rand Silver (Inc.), Walker Mining Company, Engels Copper Mining Company, Palisades Mines Company, California Zinc Company, Mason Mining Company (Balaklala), Mono Mining Company of Nevada, American Metals (Inc.) (Darwin), North Star Mines Company, and the Santa Catalina Island Company."

Silver Production of California, by Years.

The amount and value of the silver production of California, and the average price, annually, since 1880 are given in the table following. In the table shown in the statistical bulletins previous to Bulletin 97

(for 1925), the values shown for 1880–1904 (inc.) were taken from the reports of the Director of the Mint, of which the figures for 1880–1896 (inc.) were based on 'coinage value' ($1.2929 per fine ounce). We have recalculated these to commercial value, using the price table of the U. S. Geological Survey (McCaskey, H. D., Gold and Silver, 1913: Mineral Resources of the U. S., Part I, p. 847). From 1905 to date, the figures are those of the U. S. Geological Survey and its successor, the U. S. Bureau of Mines:

Year	Fine oz.	Value	Average price per oz.	Year	Fine oz.	Value	Average price per oz.
1880	882,169	$1,014,494	$1 15	1905	1,076,174	$650,009	$0 61
1881	580,091	655,503	1 13	1906	1,220,641	817,830	68
1882	653,569	745,069	1 14	1907	1,138,856	751,646	66
1883	1,129,244	1,253,461	1 11	1908	1,647,278	873,057	53
1884	3,236,987	3,593,056	1 11	1909	2,098,253	1,091,092	52
1885	1,986,260	2,125,298	1 07	1910	1,840,085	993,646	54
1886	1,245,747	1,233,290	0 99	1911	1,270,445	673,336	53
1887	1,262,282	1,237,036	0 98	1912	1,300,136	799,584	615
1888	1,314,874	1,235,982	0 94	1913	1,378,399	832,553	604
1889	823,947	774,510	0 94	1914	1,471,859	813,938	553
1890	820,336	861,353	1 05	1915	1,678,756	851,129	507
1891	737,224	729,852	0 99	1916	2,564,354	1,687,345	658
1892	358,575	311,960	87	1917	1,775,431	1,462,955	824
1893	415,468	324,065	78	1918	1,427,711	1,427,711	1 00
1894	229,896	144,834	63	1919	1,107,189	1,240,051	1 12
1895	463 911	501,542	65	1920	1,706,327	1,859,896	1 09
1896	326,757	222,195	68	1921	3,629,223	3,629,223	1 00
1897	754,648	452,789	60	1922	3,100,065	3,100,065	1 00
1898	701,788	414,055	59	1923	3,559,443	2,918,743	82
1899	855,869	513,521	60	1924	3,555,133	2,381,952	67
1900	1,168,157	724,257	62	1925	3,054,416	2,119,765	694
1901	950,831	570,499	60	1926	2,022,460	1,262,015	624
1902	1,163,041	616,412	53	1927	1,620,242	918,677	567
1903	958,230	517,444	54				
1904	1,441,259	835,929	58	Totals	69,704,036	$54,564,624	

TIN

Bibliography: Reports XV, XVII, XVIII. Bulletins 67, 91.

In 1927 there was no production of tin, although there is considerable work being done to reopen the Temescal mine in Riverside County near Corona. There was an output from the district during 1891–1892 as tabulated below. Small quantities of stream tin have been found in some of the placer workings in northern California, but never in paying amounts.

Two occurrences have also been noted, in northern San Diego County. Crystals of cassiterite were found there, associated with blue tourmaline crystals, amblygonite and beryl. No commercial quantity has been developed, only small pockets have been taken out.

The principal sources of the world's supply of tin are the islands of Banka, Billiton and Singkep, Netherlands India (Dutch East Indies), followed by the Federated Malay States (Perak, Pahang, Negri Sembilan and Selangor). Bolivia, Siam, Cornwall, Transvaal, New South Wales, Queensland and Tasmania are also important sources. A measureable amount of the metal is also recovered by detinning scrap and old cans.

Total Output of Tin in California

Year	*Pounds*	*Value*
1891	125,289	$27,564
1892	126,000	32,400
Totals	251,289	$59,964

TITANIUM

Bibliography: State Mineralogist's Report XXIII.

In 1927 for the first time titanium minerals were mined in California. These operations were in Los Angeles County, where one of the largest deposits of titanium ore in the United States is located. There were two separate operations, one worked the black beach sands, which probably contained approximately 20% titaniferous iron and magnetite, the gangue being silica and several silicates. The other is a lode deposit in the San Gabriel Mountains.

Titanium is widely distributed in a variety of minerals, but its commercial sources are limited to three forms, rutile (oxide), ilmenite (titanite), and titaniferous magnetite (iron ore rich in titanium). There are several known areas where large deposits of these minerals are found in America, mostly titaniferous iron. Of the titaniferous iron deposits only a portion of the Adirondack deposit, some small deposits in North and South Carolina, and those in Los Angeles County are capable of being separated into a high-grade ilmenite and a low titanium magnetite.

The metal is used in several different alloys with iron, copper and aluminum and for green and white paint pigments, the only colors of titanium pigments now in common use. It is also used in dyes, rubber, as a porcelain glaze, in glass, and cement made from high-titanium iron slags. This cement is resistant to the action of acids.

The market price of titanium minerals varies as to the titanium oxide it contains. Rutile 96% TiO @ 11¢ to 13¢ a pound, ilmenite 52 to 60% TiO @ $10 to $15 a ton, and ilmenite 32 to 35% TiO @ $7 to $8 a ton, all prices Atlantic seaboard.

TUNGSTEN

Bibliography: Reports XV, XVII, XVIII, XXII. Bulletins 38, 67, 91, 95. U. S. G. S. Bull. 652. Proc. Colo. Sci. Soc. Vol. XI. South Dakota School of Mines, Bulletin No. 12. Eng. and Min. Jour.-Press, Vol. 113, pp. 666–669, Apr. 22, 1922.

The commercial production of tungsten ores and concentrates in California began in 1905; and has been continuous since, with the exception of 1920–1922 (inclusive), when the mines were shut down owing to low prices due to excess stocks following the war and to lack of tariff protection against foreign importations. Production was resumed on a small scale late in 1923, and is now at practically its pre-war average annual tonnage, though the 1927 figures are less than those for 1926.

The material shipped in 1927 included both high-grade sorted ore and concentrates, coming from a property in San Bernardino County. Prices during 1927 ranged from $10.25 to $11.75 per unit, duty paid, for Chinese wolframite, with domestic scheelite $10 to $11. Present prices are approximately the same.

Tungsten ore has been produced in California principally in the Atolia-Randsburg district in San Bernardino and Kern counties, followed by the Bishop district in Inyo County, with small amounts coming from Nevada County and from the district near Goffs, in eastern San Bernardino. Most of the California tungsten ore is scheelite (cal-

cium tungstate), though wolframite (iron-manganese tungstate) and hübernite (manganese tungstate) also occur. The deposits at Atolia are the largest and most productive scheelite deposits known,[1] and the output has in some years equaled or exceeded that of ferberite (iron tungstate) from Boulder County, Colorado. It is interesting in this connection to note that, in practically all other tungsten producing districts of the world, wolframite is the important constituent.

Imports of foreign tungsten ore and alloys into the United States during 1927 amounted to 1,613,616 pounds valued at $308,106, compared with 3,441,975 pounds valued at $871,294 in 1926, and 10,362 long tons of ore valued at $11,409,237 in 1918, which ores were duty free up to September 22, 1922. Owing to lack of protection against the cheap coolie labor of Asiatic tungsten mines, and low market prices, practically all of the tungsten mines in the United States were closed down from the middle of 1919 to the latter part of 1923. Quotations during 1922 ranged around $2.50 per unit, up to September. The Tariff Act of 1922 placed a duty on tungsten ore or concentrates of 45¢ per pound on the metallic tungsten contained therein. Duties are also provided for imported tungsten-bearing alloys. Most of the imported ore is coming from China, with smaller amounts from Malaya and Bolivia.

Uses.

The metal, tungsten, is used mainly in the steel industry and in the manufacture of electrical appliances, including the well-known tungsten filament lamps. Because of its resistance to corrosion by acids, it is valuable in making certain forms of chemical apparatus. Its employment in tool-steel alloys permits the operation of cutting tools, such as in lathe work, at a speed and temperature at which carbon steel would lose its temper—hence the name 'high speed' steels for these tungsten alloys. As made in the United States, tungsten forms 13% to 20% of such steels. Some chromium, nickel, cobalt, or vanadium are sometimes also included. Tungsten compounds are used in the manufacture of colors. The indicated consumption is approximately 5000 tons of 60% concentrates per year, in the United States.

Tungsten is introduced into the molten steel charge, either as the powdered metal or as ferro-tungsten (containing 50%–85% tungsten). The specific gravity of the pure metal, 19.3–21.4, is exceeded only by platinum, 21.5; iridium, 22.4; and osmium, 22.5. Its melting point is 3267° C. (5913° F.), being higher than any other known metal. Though millions of tungsten filament lamps are now made, the wires are so fine that the metal they contain represents but a few tons of tungsten concentrates annually.

Total Tungsten Ore Production of California.

The annual amount and value of tungsten ores and concentrates produced in California since the inception of the industry is given herewith, with tonnages recalculated to 60% WO_3:

[1] U. S. G. S. Bull. 652, p. 32.

Year	Tons at 60% WO_3	Value	Year	Tons at 60% WO_3	Value
1905	57	$18,800	1917	2,466	$3,079,013
1906	485	189,100	1918	1,982	2,832,222
1907	287	120,587	1919	214	219,316
1908	105	37,750	1920		
1909	577	190,500	1923	34	19,126
1910	457	208,245	1924	781	446,009
1911	387	127,706	1925	573	348,475
1912	572	206,000	1926	441	316,560
1913	559	234,673	1927	*	
1914	420	180,575			
1915	962	1,005,467	Totals	13,629	$14,351,641
1916	2,270	4,571,521			

* Under "unapportioned."

VANADIUM

Bibliography: Report XV. Bulletins 67, 91. Proc. Colo. Sci. Soc., Vol. XI. U. S. Bur. of Mines, Bulletin 104.

No commercial production of vanadium has yet been made in California. Occurrences of this metal have been found at Camp Signal, near Goffs, in San Bernardino County, and two companies at one time did considerable development work in the endeavor to open up paying quantities. Each had a mill under construction in 1916, but apparently no commercial output was made. Ore carrying the mineral cuprodescloizite and reported as assaying 4% V_2O_5 was opened up. Some ore carrying lead vanadate has been developed in the 29 Palms, or Washington district, on the line between Riverside and San Bernardino counties, but no shipments reported.

The principal use of vanadium is as an alloy in steels, especially in tool steel, and in those varieties where resistance to repeated strains is required. Present New York quotations for ferrovanadium are, per pound of vanadium, f. o. b. works, $3.15–$3.65, depending on the grade.

ZINC

Bibliography: State Mineralogist Reports XIV, XV, XVII, XVIII, XX, XXII, XXIII. Bulletins 38, 67, 91.

The recoverable zinc mined in California in 1927 amounted to 8,625,004 pounds valued at $552,000 compared with 20,447,559 pounds and $1,533,568 in 1926. This production came from Shasta, Los Angeles (Santa Catalina Island) and Riverside counties and was shipped in the form of concentrates and sinter to Belgium, though a small amount is used in the manufacture of oxide.

The average price per pound quoted for the metal in 1927 was 6.4¢ as against 7.5¢ in 1926.

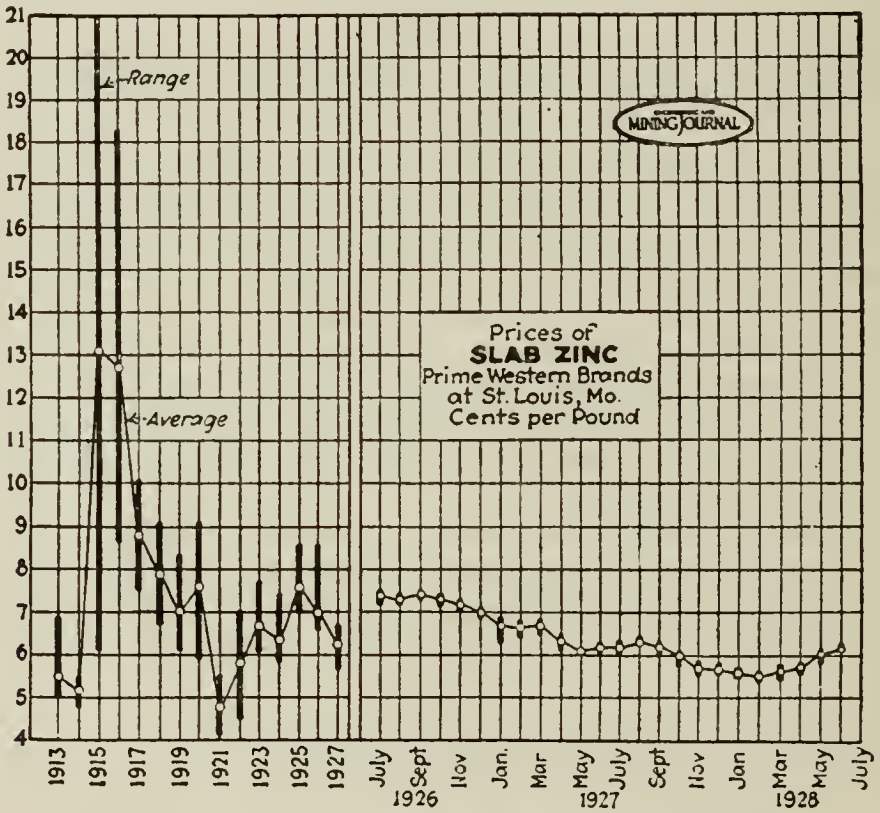
The zinc ores of Shasta and Calaveras counties are associated with copper, while those of Inyo, Los Angeles and San Bernardino are associated principally with lead-silver and zinc-silver ores.

The principal uses of zinc are for 'galvanizing' (plating on iron to prevent rust), for zinc oxide (used in rubber goods and paint), and for brass (an alloy of copper and zinc). These outlets for the metal take approximately 80% of the quantity produced. Of the remaining 20%

a large portion is rolled into plates and sheets, and utilized in the building industry for sheathing, roofing, leaders, and eaves-troughs. Zinc is particularly desirable and effieient for roofing and siding where corrosive gases are present, as at smelters, refineries and chemical plants.

Zinc Production of the United States.

The production of slab zinc [1] at reduction plants in the United States in 1927 amounted to 576,960 short tons valued at $73,966,000, not including 15,556 tons of primary metal made from foreign ores, mostly from Mexico, and reduced in refineries in this country. The 1927 production was a decline from that of 1926 of 82,261 tons.



From *Engineering and Mining Journal*, July 14, 1928.

Total Zinc Production of California.

Total figures for zinc output of the state are as follows, commercial production dating back only to 1906:

Year	Pounds	Value	Year	Pounds	Value
1906	206,000	$12,566	1918	5,565,561	$506,466
1907	177,759	10,598	1919	1,384,192	101,046
1908	54,000	3,544	1920	1,188,009	96,229
1909			1921	846,184	42,309
1910			1922	3,034,430	172,963
1911	2,679,842	152,751	1923		
1912	4,331,391	298,866	1924	3,060,000	198,900
1913	1,157,947	64,845	1925	11,546,602	877,542
1914	399,641	20,381	1926	20,447,559	1,533,568
1915	13,043,411	1,617,383	1927	8,625,004	552,000
1916	15,950,565	2,137,375			
1917	11,854,804	1,209,190	Totals	105,552,901	$9,608,522

[1] Mineral Resources of U. S. in 1927 (Preliminary Summary).

CHAPTER FOUR

STRUCTURAL MATERIALS

Bibliography: State Mineralogist Reports XII–XXIII (inc.). Bulletin 38. Spurr and Wormser, "Marketing of Metals and Minerals." "Non-Metallic Minerals," by R. B. Ladoo. See also under each substance.

As indicated by this subdivision heading, the mineral substances herein considered are those more or less directly used in building and structural work. California is independent, so far as these are concerned, and almost any reasonable construction can be made with materials produced in the state. This branch of the mineral industry for 1927 was valued at $54,861,649 as compared with a total value of $54,250,571 for the year 1926, the increase being due to cement, granite and sandstone in spite of a considerable decrease in miscellaneous stone, brick, and magnesite.

Deposits of granite, marble and other building stones are distributed widely throughout this state, and transportation and other facilities are gradually being extended so that the growing demand may be met. The largest single item, cement, has had an interesting record of growth since the inception of the industry in California about 1891. Not until 1904 did the annual value of cement produced reach the million-dollar mark, following which it increased 500% in nine years; though from 1914 to 1918 there was a falling off common to all building materials. The 1927 output established a new record both in quantity and total value, exceeding the previous total value record made in 1923 by over a million dollars.

Crushed rock production is yearly becoming more worthy of consideration, due to the strides taken in the use of concrete, as well as to activity in the building of good roads. Brick, with an average annual output for a number of years worth approximately $2,000,000, had difficulty in holding its own, due to the popularity of cement and concrete. In 1920, however, the sales increased to nearly double the previous record figure of the year 1907, and in 1923 showed advances to new figures, with a slight recession in 1924–1927. This item will, no doubt, continue to be an important one, and a market for fire and fancy brick of all kinds will unquestionably never be lacking.

All fifty-eight counties contributed to this structural total for 1926. There is not a county in the state which is not capable of some output of at least one of the materials under this classification.

During 1927 building construction on the Pacific coast [1] has declined in the large cities and increased in the smaller towns. The twenty principal cities show a falling off of 20 per cent in the total of building permits.

The following summary shows the value of the structural materials produced in California during the years 1926–1927, with increases or decreases in each instance.

[1] Pacific Coast Letter, Amer. Trust Co., Sept., 1927.

Substance	1926		1927		Increase+ Decrease— Value
	Amount	Value	Amount	Value	
Bituminous rock	3,863 tons	$21,577	3,515 tons	$17,704	$3,873—
Brick and hollow tile		7,026,124		6,516,077	510,047—
Cement	13,797,137 bbls.	25,269,678	14,661,783 bbls.	26,474,935	1,205,257+
Chromite	395 tons	7,063	225 tons	5,063	2,000—
Granite		655,332		1,398,443	743,111+
Lime	63,568 tons	670,837	60,498 tons	631,497	39,340—
Magnesite	50,915 tons	587,642	46,093 tons	577,887	9,755—
Marble	34,806 cu. ft.	119,999	[a]42,308 cu. ft.	103,689	16,310—
Onyx and Travertine	15,090 cu. ft.	7,575	[b]		+
Sandstone	34,100 cu. ft.	17,500	22,900 cu. ft.	205,400	187,900+
Slate		7,371		17,960	10,589+
Miscellaneous stone		19,859,873		18,912,994	946,879—
Total value		$54,250,571		$54,861,649	
Net increase					$611,078+

[a] Includes onyx and travertine.
[b] Combined with marble.

ASPHALT

Bibliography: State Mineralogist Reports VII, X, XII–XV (inc.), XVII, XVIII. Bulletins 16, 32, 63, 67, 69, 91.

Asphalt was for a number of years accounted for in the statistical reports by the State Mining Bureau, because in the early days of the oil industry, considerable asphalt was produced from outcroppings of oil sand, and was a separate industry from the production of oil itself. However, at the present time most of the asphalt comes from the oil refineries, which produce a better and more uniform grade; hence, its value is not now included in the mineral total, as to do so would be in part a duplication of the crude petroleum figures. Such natural asphalt as is at present mined is in the form of bituminous sandstones, and is recorded under that designation.

BITUMINOUS ROCK

Bibliography: State Mineralogist Reports XII, XIII, XV, XVII, XVIII, XXI, XXII.

This material is essentially an uncemented sandstone which is saturated with and held together by a natural asphaltic constituent, probably the residue from the evaporation of a crude petroleum deposit. Bituminous rock is still used to a limited extent for road dressing in those districts adjacent to available deposits, though the manufacture of asphalt at the oil refineries has almost entirely superseded the direct use of the native material. The present operators of the quarry near the old City Street Improvement Company's property in Santa Cruz County advise that they are now putting on the market a material which can be laid cold. It will be especially applicable and valuable for patching jobs.

Shipments from quarries in Santa Barbara and Santa Cruz counties in 1927 totaled 3515 tons of bituminous rock, valued at $17,704 f. o b. rail-shipping point.

Bituminous Rock Production of California, by Years.

The following tabulation shows the total amount and value of bituminous rock quarried and sold in California, from the records compiled by the State Mining Bureau, annually since 1887:

Year	Tons	Value	Year	Tons	Value
1887	36,000	$160,000	1909	34,123	$116,436
1888	50,000	257,000	1910	87,547	165,711
1889	40,000	170,000	1911	75,125	117,279
1890	40,000	170,000	1912	44,073	87,467
1891	39,962	154,164	1913	37,541	78,479
1892	24,000	72,000	1914	66,119	166,618
1893	32,000	192,036	1915	17,789	61,468
1894	31,214	115,193	1916	19,449	66,561
1895	38,921	121,586	1917	5,590	18,580
1896	49,456	122,500	1918	2,561	9,067
1897	45,470	128,173	1919	4,614	18,537
1898	46,836	137,575	1920	5,450	27,825
1899	40,321	116,097	1921	8,298	43,192
1900	25,306	71,495	1922	4,624	13,570
1901	24,052	66,354	1923	2,945	11,780
1902	33,490	43,411	1924	6,040	14,922
1903	21,944	53,106	1925	2,681	10,724
1904	45,280	175,680	1926	3,863	21,577
1905	24,753	60,436	1927	3,515	17,704
1906	16,077	45,204			
1907	24,122	72,835	Totals	1,191,869	$3,682,160
1908	30,718	109,818			

BRICK AND HOLLOW TILE

Bibliography: State Mineralogist Reports VIII, X, XII–XV (inc.), XVII–XXIII (inc.). Bulletins 38, 99. Preliminary Report, No. 7. Cal. Jour. of Development, June, 1925, pp. 5–6.

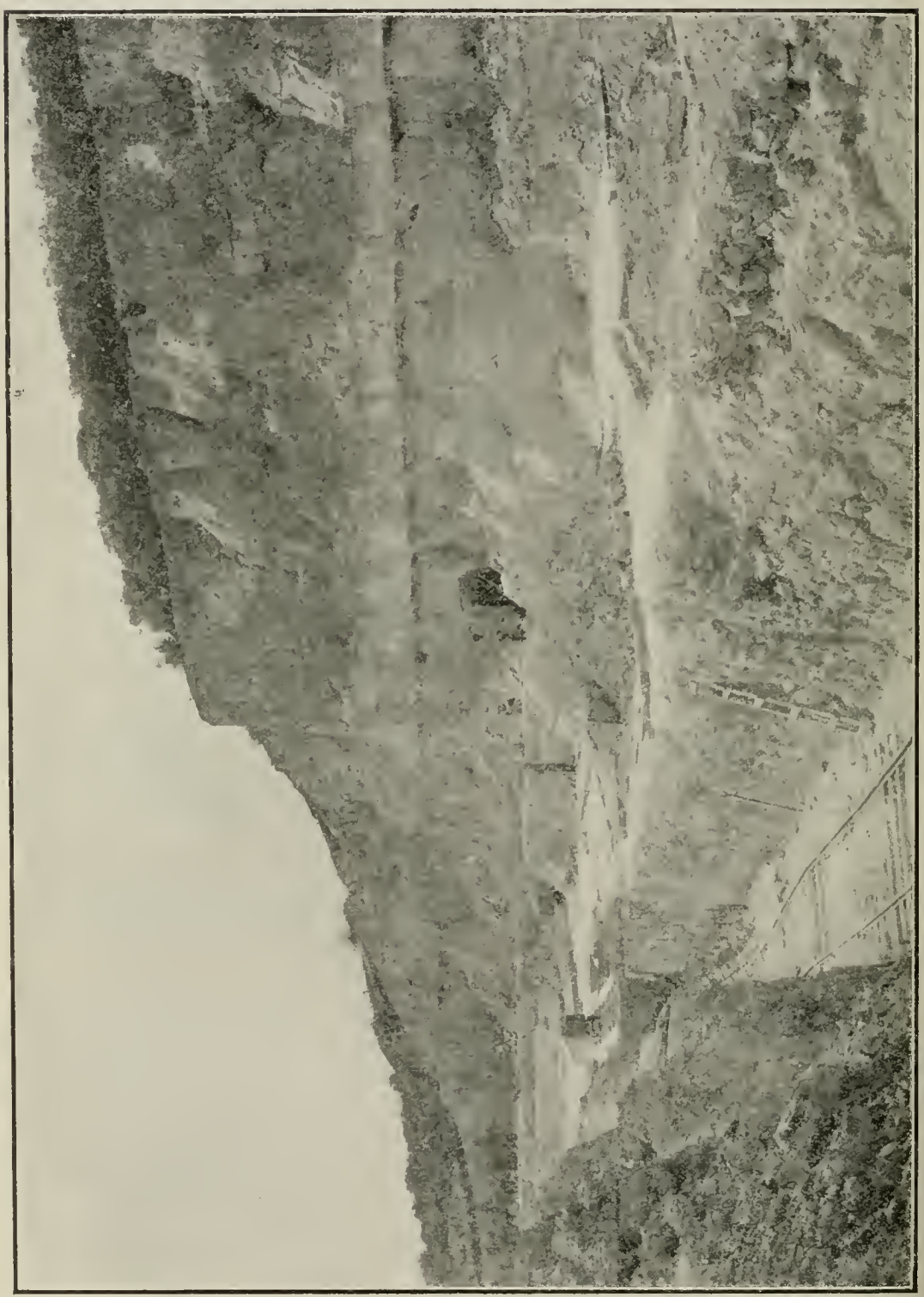
Bricks of many varieties and in important quantities are annually produced in California, as might be expected in a state with such diversified and widespread mineral resources. The varieties include common, fire, pressed, glazed, enamel, fancy, vitrified, sand-lime, and others. Not only do the plants here supply practically all of our own requirements in these products, but considerable quantities are shipped to contiguous territory and certain products are shipped over a much wider radius. So far as possible, the different kinds have been segregated in the tabulation herewith accompanying.

We also include under this heading the various forms of hollow building 'tile' or blocks. The application of these tile to residence construction as well as to other structures is growing; though their total for 1927 shows a drop from the figures of 1926.

The aggregate value of all kinds of brick in 1927 shows a decrease of approximately 7 per cent from that of 1926, to which each of the groups contributed.

Bulletin No. 99, "The Clay Resources and the Ceramic Industry of California," published this year (1928) covers all the brick plants throughout the state, giving a detailed description of each.

The detailed figures of brick and tile production for 1927, by counties, are shown in the following tabulation:



Sand Pit of Ione Fire Brick Co., Amador County. Photo by courtesy of the company.

Brick and Hollow Tile Production for 1927, by Counties

County	Common		Fire		Glazed, pressed, fancy, vitrified, paving		Hollow building tile or blocks		Total value
	Amount	Value	Amount	Value	Amount	Value	Tons	Value	
Fresno	[b]5,805	$79,539			*		*		$79,539
Kern	4,835	50,438							50,438
Los Angeles	199,352	1,924,149	8,055	$164,451	[c]6,925	$325,798	28,950	$288,471	3,002,869
Orange	1,283	13,143							13,143
Riverside	*		8,774	396,321	7,706	223,391	4,486	40,243	659,955
Sacramento	14,273	280,025	*				*		280,025
San Diego	6,495	78,987	*		429	12,207	9,079	71,086	162,280
San Joaquin	9,130	103,800	*				20,039	148,086	251,886
Santa Clara	[b]20,254	199,472							199,472
Alameda, Amador, Butte, Contra Costa, Humboldt, Marin, Merced, Riverside, San Luis Obispo, Santa Barbara, Tehama, Tulare, Ventura, Yuba*	45,063	533,378							533,378
Alameda, Amador, Contra Costa, Placer, Sacramento, San Diego, San Joaquin*			7,507	611,876					611,876
Alameda, Amador, Butte, Contra Costa, Fresno, Merced, Placer, Tulare, Ventura*					[a]28,225	342,442			342,442
Alameda, Amador, Contra Costa, Fresno, Merced, Sacramento, San Luis Obispo, Santa Barbara, Tulare, Ventura*							12,562	328,774	328,774
Totals	306,490	$3,262,931	24,336	$1,472,648	43,285	$903,838	75,116	$876,660	$6,516,079

*Combined to conceal output of a single operator in each.
[a] Includes paving brick.
[b] Includes crushed brick.
[c] Includes special sewer brick.

Brick and Hollow Tile Production of California, by Years.

Record of brick production in the state has been kept since 1893 by this Bureau, the figures for hollow building 'tile' or blocks being also included since 1914. The annual and total figures, for amount and value, are given in the following table:

Year	*Brick, M*	*Hollow building blocks, tons*	*Value*
1893	103,900	------	$801,750
1894	81,675	------	457,125
1895	131,772	------	672,360
1896	24,000	------	524,740
1897	97,468	------	563,240
1898	100,102	------	571,362
1899	125,950	------	754,730
1900	137,191	------	905,210
1901	130,766	------	860,488
1902	169,851	------	1,306,215
1903	214,403	------	1,999,546
1904	281,750	------	1,994,740
1905	286,618	------	2,273,786
1906	277,762	------	2,538,848
1907	362,167	------	3,438,951
1908	332,872	------	2,506,495
1909	333,846	------	3,059,929
1910	340,883	------	2,934,731
1911	327,474	------	2,638,121
1912	337,233	------	2,940,290
1913	358,754	------	2,915,350
1914	270,791	------	2,288,227
1915	180,538	------	1,678,756
1916	206,960	------	2,096,570
1917	192,269	29,348	2,532,721
1918	136,374	34,818	2,363,481
1919	156,328	36,026	3,087,067
1920	245,842	99,208	5,704,393
1921	238,022	67,100	5,570,875
1922	374,853	105,909	7,994,991
1923	397,754	122,534	9,738,082
1924	456,716	114,469	9,137,908
1925	361,094	105,491	7,503,976
1926	388,048	90,332	7,026,124
1927	374,111	75,116	6,516,077
Totals	8,536,137	880,351	$109,897,255

CEMENT

Bibliography: State Mineralogist Reports VIII, IX, XII, XIV, XV, XVII, XVIII, XXI–XXIII, Bulletin 38.

Cement is the most important single structural material in the mineral output of California. During 1927 there was produced a total of 14,661,783 barrels valued at $26,474,935 f. o. b. plant, being an increase of over half a million barrels in quantity, and in total value although there was a small drop in prices. The 1926 output was 13,797,173 barrels, valued at $25,269,678, or an average of $1.84 per barrel. The 1927 average was $1.80 per barrel.

The 1927 production came from twelve operating plants in ten counties, and employed a total of 3803 men. The three plants in San Bernardino County made a total of 5,557,339 barrels, valued at $9,823,839, the balance of the state's product coming from a single plant in each of the following counties: Calaveras, Contra Costa, Kern, Merced, Riverside, San Benito, San Mateo, Santa Cruz, and Solano. The new plant of the Yosemite Portland Cement Company at Merced began operations and made commercial shipments in 1927.

There has been an interesting parallelism in the growth of the portland cement and the crushed rock, sand and gravel industries in California. The use of concrete has been a most important development in structural work during the last 20 or 30 years, and has made possible the building of such great monolithic structures as our irrigation and hydroelectric-power dams, as well as highway pavements and skyscraper office buildings.

In 1927 the total production of the United States as given by the U. S. Bureau of Mines, was 171,864,728 barrels of portland cement valued at $278,854,647, of which approximately 45,000,000 barrels were used in the construction of roads and streets in the United States, from which approximately 6000 miles of concrete rural roads, 3000 miles of streets, and 475 miles of alleys were built.

Cement Production of California, by Years.

'Portland' cement was first commercially produced in California in 1891; though in 1860 and for several years following, a natural hydraulic cement from Benicia was utilized in building operations in San Francisco.

[1] "The Benicia Cement Company in 1859–60 was turning out 50 to 100 barrels of cement a day and San Francisco was using about 12,000 barrels a year. The mill price of the product was then $4 a barrel. By 1865, the San Francisco rate of consumption had increased to 100,000 barrels yearly, brick buildings largely taking the place of frame structures, and the price of cement had fallen to $2.50 a barrel, about the same as it is today."

The growth of the industry became rapid after 1902; since which time cement has continued to be an important factor in the industrial life of the state. Although the total cement figures, to date, are not of the same magnitude as those for gold and petroleum, it is interesting to note that the value of California's cement yield beginning with 1920 has since annually exceeded the value of her gold output.

Annual production of cement in California has been as follows:

Year	Barrels	Value	Year	Barrels	Value
1891	5,000	$15,000	1911	6,371,369	$9,085,625
1892	5,000	15,000	1912	6,198,634	6,074,661
1893			1913	6,167,806	7,743,024
1894	8,000	21,600	1914	5,109,218	6,558,148
1895	16,383	32,556	1915	4,918,275	6,044,950
1896	9,500	28,250	1916	5,299,507	6,210,293
1897	18,000	66,000	1917	5,790,734	7,544,282
1898	50,000	150,000	1918	4,772,921	7,969,909
1899	60,000	180,000	1919	4,645,289	8,591,990
1900	52,000	121,000	1920	6,709,160	14,962,945
1901	71,800	159,842	1921	7,404,221	18,072,120
1902	171,000	423,600	1922	8,962,135	16,524,056
1903	640,868	968,727	1923	10,825,405	25,999,203
1904	969,538	1,539,807	1924	11,655,131	23,225,850
1905	1,265,553	1,791,916	1925	13,206,630	25,043,335
1906	1,286,000	1,941,250	1926	13,797,173	25,269,678
1907	1,613,563	2,585,577	1927	14,661,783	26,474,935
1908	1,629,615	2,359,692			
1909	3,779,205	4,969,437	Totals	153,599,609	$266,249,963
1910	5,453,193	7,485,715			

[1] Monthly Review of Mercantile Trust Co. of Cal., Vol. XIII, No. 3, p. 55, Mar. 1924.

CHROMITE

Bibliography: State Mineralogist Reports IV, XII, XIII, XIV, XV, XVII, XVIII, XXI–XXIII. Bulletins 38, 76, 91. Preliminary Report 3. U. S. G. S., Bull. 430. Min. & Sci. Press, Vol. 114, p. 552.

Chromic iron ore, or chromite, to the amount of 225 short tons recalculated to the basis of 45% Cr_2O_3, valued at $5,063 f. o. b. shipping point, was sold during the year 1927 in California. This was largely of ore that had been mined during the World War period but not then sold. It is hoped that the development of the steel industry and the resumption of copper smelting on the Pacific Coast may create some demand for California's chromite, but the outlook for the immediate future is not encouraging.

The political and commercial control of chromite now rests largely with England, through the ownership and sales contracts exercised by the Chrome Company (Ltd.), of London. That company controls both the Rhodesian and the New Caledonian output.

Occurrence.

Until 1916, when some shipments were made from Oregon and smaller amounts from Maryland, Wyoming and Washington, practically our only domestic production of chromite for many years came from California. From 1830 to 1870 the deposits in Maryland supplied the world's consumption.

Chromite is widely distributed in California, the principal production, thus far, having come from El Dorado, San Luis Obispo, Del Norte, Shasta, Siskiyou, Placer, Fresno, and Tuolumne counties. In 1918 a total of 29 counties contributed to the state's output. There are two main belts in California yielding this mineral, one along the Coast Ranges from San Luis Obispo County to the Oregon line, including the Klamath Mountains at the north end, and the other in the Sierra Nevada from Tulare County to Plumas County. Chromite occurs as lenses in basic igneous rocks such as peridotite and pyroxenite, and in serpentines which have been derived by alteration of such basic rocks. For the most part, so fas as developments have yet shown, the lenses have proved to be small, relatively few of them yielding over 100 tons apiece. A notable exception to this was the deposit on Little Castle Creek, near Dunsmuir, from which upwards of 15,000 tons were shipped before it was exhausted. Deposits worked in Del Norte County during 1918 promise well for a large tonnage. On the whole the orebodies in the northwestern corner of the state appear to average larger in size than the chromite lenses in other parts of California.

Concentration became an accomplished fact in several localities, thus utilizing some of the disseminated and lower-grade orebodies which have been found. In fact, an important part of the 1918–1920 production of California came from that source.

Imports.

Importations of foreign chromite, duty free, mainly from Rhodesia, New Caledonia, and India, totaled 222,360 long tons in 1927, valued at $1,738,598, compared with 215,464 long tons and $1,704,947 in 1926.

Uses.

The major consumption of chromite ore is for use as a refractory lining in smelting furnaces for steel and copper. A smaller portion is used in the preparation of ferrochrome for chrome-steel alloys, and of chromium chemicals, the latest development of which is chrome plating as used in the automobile industry, on ships, and in oil refineries to protect metal surfaces from wear and erosion. It is stated that during the last three years, the sales of chromite brick and chromite cement have increased 500%, because of their replacing magnesite which is more expensive.

Total Chromite Production of California.

Production of chromite in California began, apparently, about 1874, principally in San Luis Obispo County. There was considerable activity from 1880 to 1883, inclusive, and a total of 23,238 long tons (or 26,028 short tons), valued at $329,924 was shipped from that county up to the beginning of 1887. Some ore also was shipped from the Tyson properties in Del Norte County. The tabulation herewith shows the output of chromite in California, annually, including the earliest figures so far as they are available. The figures from 1887 to date are from the records of the State Mining Bureau:

Year	Tons	Value	Year	Tons	Value
1874–1876 (San Luis Obispo County)	26,028	$329,924	1908	350	$6,195
1887	3,000	40,000	1909	436	5,309
1888	1,500	20,000	1910	749	9,707
1889	2,000	30,000	1911	935	14,197
1890	3,599	53,985	1912	1,270	11,260
1891	1,372	20,580	1913	1,180	12,700
1892	1,500	22,500	1914	1,517	9,434
1893	3,319	49,785	1915	3,725	38,044
1894	3,680	39,980	1916	48,943	717,244
1895	1,740	16,795	1917	52,379	1,130,298
1896	786	7,775	1918	73,955	3,649,497
1897			1919	*4,314	97,164
1898			1920	1,770	43,031
1899			1921	347	6,870
1900	140	1,400	1922	379	6,334
1901	130	1,950	1923	84	1,658
1902	315	4,725	1924	350	6,700
1903	150	2,250	1925	191	3,712
1904	123	1,845	1926	393	7,063
1905	40	600	1927	225	5,063
1906	317	2,859	Totals	243,535	$6,435,023
1907	302	6,040			

*Recalculated to 45% Cr_2O_3, beginning with 1919.

GRANITE

Bibliography: State Mineralogist Reports, X, XII–XXI (inc.). Bulletin 38.

The value of the granite output in 1927 was $1,398,443, an increase over the 1926 figure of $655,332, but not reaching the record output of $1,853,859 in 1925. We have included under this heading some rhyolite and tuff utilized for dimension building stone, as we have no other dimension-stone grouping for statistical purposes in this report except marble and sandstone.

So far as possible, granite production has been segregated in the table herewith into the various uses to which the product was put. It

will be noted, however, that a portion of the output has been entered under the heading 'Unclassified.' This is necessary because of the fact that some of the producers have no way of telling to what specific use their stone was put after they had quarried and sold the same in the rough.

Varieties.

For building purposes, the granites found in California, particularly the varieties from Raymond in Madera County, Rocklin in Placer County, and near Porterville in Tulare County, are unexcelled by any similar stone found elsewhere. The quantities available, notably at Raymond and Porterville, are unlimited. Most of California's 'granite,' particularly that found in the Sierra Nevada Mountains, is technically 'granodiorite' (that is, both plagioclase and orthoclase feldspars are present).

Granites of excellent quality for building and ornamental purposes are also quarried in Riverside and San Diego counties. Near Lakeside, San Diego County, there is a fine-grained, 'silver gray' granite of uniform texture and color, especially suited for monumental and ornamental work.

The Fresno County stone is a dark, hornblende diorite, locally called 'black granite,' whose color permits of a fine contrast of polished and unpolished surfaces, making it particularly suitable for monumental and decorative purposes. There is also a similar 'black granite' in Tulare County, near Success.

Granite Production, by Counties, for 1927

County	Building stone		Monumental		Curbing		Unclassified		Total value
	Cubic ft.	Value	Cubic ft.	Value	Linear ft.	Value	Cubic ft.	Value	
Fresno			17,186	$74,424					$74,424
Lassen					740	$1,000			1,000
Mariposa					2,000	2,000			2,000
Placer	1,670	$2,250	6,920	15,859					18,109
Sacramento	6,400	25,600			4,000	8,000			33,600
San Diego	125	281	18,733	62,861					63,142
Inyo[a], Madera, Monterey[b], Plumas, Riverside*	102,519	820,674							820,674
Madera, Nevada, Plumas, Riverside*			95,574	192,232					192,232
Madera, Nevada*					925	2,494			2,494
Madera, Monterey[b], Tulare*							93,500	$190,768	190,768
Totals	110,714	$848,805	138,413	$345,376	7,665	$13,494	93,500	$190,768	$1,398,443

* Combined to conceal output of a single operator in each.
[a] Tuff used for building stone.
[b] Andesite used for building stone.

Granite Production of California, by Years.

The value of granite produced, annually, since 1887, has been as follows:

Year	Value	Year	Value
1887	$150,000	1909	$376,834
1888	57,000	1910	417,898
1889	1,329,018	1911	355,742
1890	1,200,000	1912	362,975
1891	1,300,000	1913	981,277
1892	1,000,000	1914	628,786
1893	531,322	1915	227,928
1894	228,816	1916	535,339
1895	224,329	1917	221,997
1896	201,004	1918	139,861
1897	188,024	1919	220,743
1898	147,732	1920	495,732
1899	141,070	1921	725,901
1900	295,772	1922	676,643
1901	519,285	1923	760,081
1902	255,239	1924	1,211,046
1903	678,670	1925	1,853,859
1904	467,472	1926	655,332
1905	353,837	1927	1,398,443
1906	344,083		
1907	373,376	Total value	$22,745,389
1908	512,923		

LIME

Bibliography: Reports XIV, XV, XVII, XVIII. Bulletin 38.

Lime to the amount of 60,498 tons, valued at $631,497, was produced by nine plants in seven counties during 1927, as compared with 63,568 tons, valued at $670,837, in 1926. There were two plants each in San Bernardino and Santa Cruz counties, and one each in Inyo, Kern, Plumas, Tulare, and Tuolumne.

So far as we have been able to segregate the data, these figures include mainly only such lime as is used in building operations; though they do include a small proportion of calcined lime employed in agriculture and the chemical industries, the figures for which were not separable. A portion is hydrated lime. Limestone utilized in sugar making, for smelter flux, as a fertilizer, and other special industrial uses, are classified under 'Industrial Materials.' That consumed in cement manufacture is included in the value of cement.

Lime Production of California, by Years.

The following tabulation gives the amounts and value of lime produced in California by years since 1894 when compilation of such records was begun by the State Mining Bureau. The figures for quantity have been recalculated from 'barrels' to 'tons' for the years 1894–1922 (inc.):

Year	Tons	Value	Year	Tons	Value
1894	37,350	$318,700	1912	52,212	$464,440
1895	39,776	386,094	1913	61,344	528,547
1896	30,275	261,505	1914	43,996	378,663
1897	28,780	252,900	1915	35,653	286,304
1898	29,786	254,010	1916	49,364	390,475
1899	29,985	314,575	1917	50,073	311,380
1900	31,252	283,699	1918	43,684	461,315
1901	31,738	334,688	1919	42,070	552,043
1902	44,866	369,616	1920	46,314	557,232
1903	49,659	418,280	1921	46,353	610,619
1904	57,945	571,749	1922	57,875	671,747
1905	61,700	555,322	1923	70,894	788,834
1906	68,927	763,060	1924	62,029	703,355
1907	68,422	756,376	1925	61,922	685,528
1908	39,639	379,243	1926	63,568	670,837
1909	52,075	577,824	1927	60,498	631,497
1910	47,951	477,683			
1911	42,959	390,988	Totals	1,640,934	$16,359,128

MAGNESITE

Bibliography: State Mineralogist Reports XII–XV (inc.), XVII–XXIII. Bulletins 38, 79, 91. U. S. Geol. Surv. Bulletins 355, 540; Min. Res. 1913, Pt. II, pp. 450–453. Min. & Sci. Press, Vol. 114, p. 237. "Magnesite"—Hearings before the Comm. on Ways and Means, House of Repr., on H. R. 5218, June 16, 17, and July 17, 1919. Eng. Soc. W. Penn., Proc. 1913, Vol. 29, pp. 305–388, 418–444. Eng. & Min. Jour.-Press, Vol. 114, July 29, and Dec. 2, 1922. U. S. Tariff Comm., "Crude and Caustic Calcined Magnesite. A Preliminary Statement of Information," May 19, 1926.

The production of magnesite in California during 1927 amounted to a total of 46,093 tons of crude ore, valued at $577,887. Only a small part of it was sold 'crude,' however, as it is practically all shipped in the calcined form. The reports at hand show a total of 19,277 tons shipped calcined, including a small tonnage dead-burned for refractory purposes, the balance going to the plastic trade. From 2 to 2½ tons of crude material are mined to make one ton of calcined. The 1927 output is a decrease both in quantity and value from the 1926 figures of 50,915 tons crude valued at $587,642. The average of the values reported for 1927 is $12.50 per ton compared with $11.60 in 1926. There were two operators who produced 1300 tons of crude but who had not shipped any during 1927 though they expect to do so in 1928.

Occurrence.

Magnesite is a natural carbonate of magnesium, and when pure contains 52.4% CO_2 (carbon dioxide), and 47.6% MgO (magnesia). It has a hardness of 3.5 to 4.5, and specific gravity of 3 to 3.12. It is both harder and heavier than calcite (calcium carbonate), and also contains a higher percentage of CO_2 as calcite has but 44%.

Most of the Californian magnesite is comparatively pure, and is ordinarily a beautiful, white, fine-grained rock with a conchoidal fracture resembling a break in porcelain. The Grecian magnesite is largely of this character; but the Austrian varieties usually contain iron, so that they become brown after calcining. The Washington magnesite resem-

bles dolomite and some crystalline limestones in physical appearance. Its color varies through light to dark gray, and pink.

In California the known deposits are mostly in the metamorphic rocks of the Coast Ranges and the Sierra Nevada, being associated with serpentine areas. The notable exceptions are the sedimentary deposits, at Bissell in Kern County and at Afton in San Bernardino County. Several thousand tons have been shipped from the Bissell deposit; and small shipments have been made from the Afton property.

The Washington deposits are associated with extensive strata of dolomite limestone. The magnesite there appears to contain more iron than most of the California mineral, which makes it desirable for the steel operators. However, recent experience has proved that several California localities have sufficient iron in their magnesite to be serviceable in the steel furnaces.

Uses.

The principal uses include: Refractory linings for basic open-hearth steel furnaces, copper reverberatories and converters, bullion and other metallurgical furnaces; in the manufacture of paper from wood plup; and in structural work, for exterior stucco, for flooring, wainscoting, tiling, sanitary kitchen and hospital finishing, etc. In connection with building work it has proved particularly efficient as a flooring for steel railroad coaches, on account of having greater elasticity and resilience than 'Portland' cement. For refractory purposes the magnesite is 'dead-burned'—*i. e.*, all or practically all of the CO_2 is expelled from it. For cement purposes it is left 'caustic'—*i. e.*, from 2% to 10% of CO_2 is retained. When dry caustic magnesite is mixed with a solution of magnesium chloride ($MgCl_2$) in proper proportions, a very strong cement is produced, known as oxychloride or Sorel cement. It is applied in a plastic form, which sets in a few hours, as a tough, seamless surface. It has also a very strong bonding power, and will hold firmly to wood, metal, or concrete as a base. It may be finished with a very smooth, even surface, which will take a good wax or oil polish. As ordinarily mixed there is added a certain proportion of wood flour, cork, asbestos, or other filler, thereby adding to the elastic properties of the finished product. Its surface is described as 'warm' and 'quiet' as a result of the elastic and nonconducting character of the composite material. The cement is frequently colored by the addition of some mineral pigment to the materials before mixing as cement.

For refractory purposes the calcined magnesite is largely made up into bricks similar to fire-brick for furnace linings. It is also used unconsolidated, as 'grain' magnesite. For such, an iron content is desirable, as it allows a slight sintering in forming the brick. Dead-burned, pure magnesia can not be sintered except at very high temperatures; and it has little or no plasticity, so that it is hard to handle. Its plasticity is said to be improved by using with it some partly calcined or caustic magnesite. Heavy pressure will bind the material sufficiently to allow it to be sintered.

A coating of crushed magnesite is laid on hearths used for heating steel stock for rolling, to prevent the scale formed from attacking the fire-brick of the hearth.

Before the World War, practically all of the domestic output of caustic magnesite was used in the manufacture of pulp and paper. For this purpose calcined dolomite is now used. The use of dolomite instead of magnesite by paper manufacturers began during the war when the price of magnesite was very high. Dolomite was found to be a good substitute for magnesite in the bisulphite process of paper making and so its use has continued.

Imports.

The Tariff Act of 1922, which became effective September 22d, of that year, placed the following import duties on magnesite: Crude magnesite 5/16¢ per lb., caustic-calcined magnesite 5/8¢ per lb.; dead-burned and grain magnesite, not suitable for manufacture into oxy-chloride cements, 23/40¢ per lb.; magnesite brick, 3/4¢ per lb. and 10% ad valorem. The figures of imports for 1927, as published by the U. S. Bureau of Foreign and Domestic Commerce, show a total of 60,224 short tons of calcined ore, valued at $959,483, as compared with 92,546 tons and $1,415,509 in 1926.

Total Magnesite Production of California.

The first commercial production of magnesite in California was made in the latter part of 1886 from the Cedar Mountain district,[1] southeast of Livermore, Alameda County. Shipments amounting to 'several tons' or 'several carloads' were sent by rail to New York; but there is apparently no exact record of the amount for that first year. The statistical records of the State Mining Bureau began with the year 1887, and the table herewith shows the figures for amount and value, annually, from that time. Shipments of magnesite from Napa County began in 1891 from the Snowflake Mine; from the Red Mountain deposits in Santa Clara County, in 1899; and from Tulare County in 1900.

Year	Tons	Value	Year	Tons	Value
1887	600	$9,000	1909	7,942	$62,588
1888	600	9,000	1910	16,570	113,887
1889	600	9,000	1911	8,858	67,430
1890	600	9,000	1912	10,512	105,120
1891	1,500	15,000	1913	9,632	77,056
1892	1,500	15,000	1914	11,438	114,380
1893	1,093	10,930	1915	30,271	283,461
1894	1,440	10,240	1916	154,052	1,311,893
1895	2,200	17,000	1917	209,648	1,976,227
1896	1,500	11,000	1918	83,974	803,492
1897	1,143	13,671	1919	44,696	452,094
1898	1,263	19,075	1920	83,695	1,033,491
1899	1,280	18,480	1921	47,837	511,102
1900	2,252	19,333	1922	55,637	594,665
1901	4,726	43,057	1923	73,963	946,643
1902	2,830	20,655	1924	67,236	900,183
1903	1,361	20,515	1925	64,623	872,944
1904	2,850	9,298	1926	50,915	587,642
1905	3,933	16,221	1927	46,093	577,887
1906	4,032	40,320			
1907	6,405	57,720	Totals	1,132,332	$11,866,522
1908	10,582	80,822			

[1] See U. S. Geol. Surv.; Mineral Resources of U. S., 1886, pp. 6 and 696.

MARBLE

Bibliography: State Mineralogist Reports XII–XV (inc.), XVII–XXII (inc.). Bulletin 38. U. S. Bur. of Mines, Bull. 106.

Marble is widely distributed in California, and in a considerable variety of colors and grain. The 1927 figures show a slight decline in both quantity and value from those of 1926, and are combined with onyx and travertine to conceal the output of a single operator.

California has many beautiful and serviceable varieties of marble, suitable for almost any conceivable purpose of construction or decoration. In the decorative class are deposits of onyx marble of beautiful coloring and effects. There is also serpentine marble suitable for electrical switchboard use.

Marble Production of California, by Years.

Data on annual production since 1887, as compiled by the State Mining Bureau, follows. Previous to 1894 no records of amounts were preserved.

Year	Cubic feet	Value	Year	Cubic feet	Value
1887		$5,000	1909	79,600	$238,400
1888		5,000	1910	18,960	50,200
1889		87,030	1911	20,201	54,103
1890		80,000	1912	27,820	74,120
1891		100,000	1913	41,654	113,282
1892		115,000	1914	25,436	48,832
1893		40,000	1915	22,186	41,518
1894	38,441	98,326	1916	25,954	50,280
1895	14,864	56,566	1917	24,755	62,950
1896	7,889	32,415	1918	[a]17,428	49,898
1897	4,102	7,280	1919	25,020	74,482
1898	8,050	23,594	1920	[b]29,531	92,899
1899	9,682	10,550	1921	30,232	98,395
1900	4,103	5,891	1922	38,321	127,792
1901	2,945	4,630	1923	28,015	124,919
1902	19,305	37,616	1924	[b]61,579	140,253
1903	84,624	97,354	1925	35,664	116,105
1904	55,401	94,208	1926	34,806	119,999
1905	73,303	129,450	1927	[b]42,308	103,689
1906	31,400	75,800			
1907	37,512	118,066	Total value		$3,053,557
1908	18,653	47,665			

[a]Includes onyx and serpentine.
[b]Includes onyx.

ONYX and TRAVERTINE

Bibliography: State Mineralogist Reports XII–XV (inc.), XVII, XVIII. Bulletin 38.

Onyx and travertine are known to exist in a number of places in California, but there has been only a small and irregular production since the year 1896. In 1927 there were shipments from Kern, Riverside, San Bernardino, and Solano counties with an increase in both quantity and value, the figures of which are combined with marble. This material is used in terrazzo, auto gear-shift handles, bases for fountain-pen desk sets, and other ornamental purposes.

Onyx Production of California, by Years.

Production by years has been as follows:

Year	Value	Year	Value
1887	$900	1919	----------
1888	900	1920	*
1889	900	1921	$1,294
1890	1,500	1922	3,320
1891	2,400	1923	2,510
1892	1,800	1924	*
1893	27,000	1925	16,120
1894	20,000	1926	7,575
1895	12,000	1927	*
1896	24,000		
1918	*	Total value	$122,219

*See under Marble.

SANDSTONE.

Bibliography: State Mineralogist Reports XII–XV, XVII, XVIII, XXI. Bulletin 38. U. S. Bur. of M., Bull. 124.

An unlimited amount of high-grade sandstone is available in California, but the wide use of concrete in buildings of every character, as well as the popularity of a lighter-colored building stone, has curtailed production in this branch of the mineral industry during recent years almost to the vanishing point. In 1927 a total of 22,900 cu. ft., valued at $205,400, was quarried in five counties, Monterey, Napa, Santa Barbara, Siskiyou and Sonoma; compared with 34,100 cu. ft. and $17,500 in 1926. The material reported from Monterey County is in reality an indurated shale of the Monterey series, of a cream color and utilized as a building stone; and that from Sonoma is a stratified, altered andesite having the appearance of sandstone.

A large portion of the sandstone was sold for landscape work and used as stepping stones for walks and for fountains, walls, etc.

Sandstone Production of California, by Years.

Amount and value, so far as contained in the records of this Bureau, are presented herewith, with total value from 1887 to date:

Year	Cubic feet	Value	Year	Cubic feet	Value
1887	----------	$175,000	1909	79,240	$37,032
1888	----------	150,000	1910	165,971	80,443
1889	----------	175,598	1911	255,313	127,314
1890	----------	100,000	1912	66,487	22,574
1891	----------	100,000	1913	62,227	27,870
1892	----------	50,000	1914	111,691	45,322
1893	----------	26,314	1915	63,350	8,438
1894	----------	113,592	1916	17,270	10,271
1895	----------	35,373	1917	31,090	7,074
1896	----------	28,379	1918	900	400
1897	----------	24,086	1919	5,400	3,720
1898	----------	46,384	1920	10,500	2,300
1899	56,264	103,384	1921	10,150	2,112
1900	378,468	254,140	1922	900	1,100
1901	266,741	192,132	1923	7,000	13,000
1902	212,123	142,506	1924	6,700	3,600
1903	353,002	585,309	1925	14,704	14,362
1904	363,487	567,181	1926	34,100	17,500
1905	302,813	483,268	1927	22,900	205,400
1906	182,076	164,068			
1907	159,573	148,148	Total value	----------	$4,349,845
1908	93,301	55,151			

SLATE

Bibliography: State Mineralogist Reports XV, XVIII. Bulletin 38. U. S. Geol. Surv., Bull. 586. U. S. Bur. of Mines, Bull. 218.

Slate was first produced in California in 1889. Up to and including 1910 such production was continuous, but since then it has been irregular. Large deposits of excellent quality are known in the state, especially in El Dorado, Calaveras and Mariposa counties, but the demand has been light owing principally to competition of cheaper roofing materials.

'Slate' is a term applied to a fine-grained rock that has a more or less perfect cleavage, permitting it to be readily split into thin, smooth sheets. Varieties differ widely in color and have a considerable range in chemical and mineralogical composition. Excepting certain rare slates of igneous origin (of which the green slate of the Eureka quarry, El Dorado County, California, is an example) formed from volcanic ash or igneous dikes, slates have originated from sedimentary deposits consisting largely of clay. By consolidation, and the pressure of superimposed materials, clays become bedded deposits of shale. By further consolidation under intense pressure and high temperature incident to mountain-building forces, shales are metamorphosed to slates. The principal mineral constituents are mica, quartz, and chlorite, with smaller varying amounts of hematite, rutile, kaolin, graphite, feldspar, tourmaline, calcite, and others.

The color of slate is of economic importance. The common colors are gray, bluish gray, and black, though reds and various shades of green are occasionally found.

The permanency of slate for roofing is well known. It is stated that there are slate roofs in Pennsylvania and Maryland over 100 years old.[1]

[1] "In England and Wales, and in France, many buildings constructed in the 15th and 16th centuries were roofed with slate, and the roofs are still in excellent condition. There is a record of a chapel in Bedford-on-Avon in Wiltshire, England, roofed with slate in the 8th century, and after 1200 years of climatic exopsure is moss-covered but in good condition."

Contrary to the general impression, however, the major portion of the slate produced in the United States is used on the inside rather than the outside of buildings. Its interior uses include stationary washtubs, electrical switchboards, and blackboards.

A square of roofing slate is a sufficient number of pieces of any size to cover 100 square feet of roof, with allowance generally for a three-inch lap. The sizes of the pieces of slate making up a square range from 7 x 9 inches to 16 x 24 inches, and the number of pieces in a square ranges from 85 to 686. The Ferry Building, San Francisco, is roofed with Eureka slate from El Dorado County.

In California there were shipments in 1927 amounting to 2686 tons valued at $17,960 from El Dorado, Mariposa and Tuolumne counties. This was an increase over the 1926 output valued at $7,371. Most of this slate was crushed and used for roofing granules.

[1] Bowles, O., Slate as a Permanent Roofing Material: U. S. Bur. of M., Reports of Investigations, Serial No. 2267, July, 1921, p. 4.

Total Production of Slate in California.

A complete record of amount and value of slate produced in California follows:

Year	Squares	Value	Year	Squares	Value
1889	4,500	$18,089	1906	10,000	$100,000
1890	4,000	24,000	1907	7,000	60,000
1891	4,000	24,000	1908	6,000	60,000
1892	3,500	21,000	1909	6,961	45,660
1893	3,000	21,000	1910	1,000	8,000
1894	1,800	11,700	1911		
1895	1,350	9,450	1915	1,000	5,000
1896	500	2,500	1916		
1897	400	2,800	1920	8	80
1898	400	2,800	1921		
1899	810	5,900	1922	*	*
1900	3,500	26,250	1923		
1901	5,100	38,250	1926		7,371
1902	4,000	30,000	1927		17,960
1903	10,000	70,000			
1904	6,000	50,000	Total value		$701,810
1905	4,000	40,000			

*Concealed under 'Unapportioned.'

MISCELLANEOUS STONE

Bibliography: State Mineralogist Reports XII–XXIII (inc.). Bulletin 38; also annual statistical bulletins from 1915 to date.

'Miscellaneous stone' is the name used throughout this report as the title for that branch of the mineral industry covering crushed rock of all kinds, paving blocks, sand and gravel, and pebbles for grinding mills. The foregoing are very closely related from the standpoint of the producer; therefore it has been found to be most satisfactory to group these items as has been done in recent reports of this Bureau. So far as it has been possible to do so, crushed rock production has been subdivided into the various uses to which the product was put. It will be noted, however, a very large percentage of the output has been tabulated under the heading 'Unclassified.' This is necessary because of the fact that many of the producers have no way of telling to what specific use their rock was put (or at least the proportions to each use) after they have quarried and sold the same to distributors and contractors.

In addition to amounts produced by commercial firms, both corporations and individuals, there is hardly a county in the state but uses more or less gravel and broken rock on its roads. Of much of this, particularly in the country districts, there is no definite record kept.

For the year 1927 the production of crushed rock registered a gain both in tonnage and value over the preceding year. Sand and gravel tonnage remained practically the same, although there was a drop in their value. This resulted in a total value of $18,911,194, being a decrease from $19,859,873 in 1926.

As for some years past, Los Angeles County led all others by a wide margin with an output valued at $6,292,078 (compared with $7,472,884 in 1926); followed by Alameda, second, with $1,538,017; River-

side, third, with $1,244,043; Fresno, fourth, with $1,118,761; San Diego, fifth, with $889,642; Contra Costa, sixth, with $816,140; Sacramento, seventh, with $754,206; Humboldt, eighth, with $554,963; followed in turn by Santa Clara, Ventura, Marin, San Benito, Orange, San Bernardino, Stanislaus, Monterey.

Paving Blocks.

The paving block industry has decreased materially of recent years, practically to the vanishing point, because of the increased construction of smoother pavements demanded by motor vehicle traffic. The blocks made in Solano County were of basalt; those from Sonoma are of basalt, andesite, and some trachyte, while those from Madera, Placer, Riverside, San Bernardino, and San Diego are of granite.

The amount and value of paving block production, annually, since 1887 has been as follows:

Year	Amount M	Value	Year	Amount M	Value
1887	*10,000	$350,000	1909	4,503	$199,803
1888	10,500	367,500	1910	4,434	198,916
1889	7,303	297,236	1911	4,141	210,819
1890	7,000	245,000	1912	11,018	578,355
1891	5,000	150,000	1913	6,364	363,505
1892	*3,000	96,000	1914	6,053	270,598
1893	2,770	96,950	1915	3,285	171,092
1894	2,517	66,981	1916	1,322	54,362
1895	2,332	73,338	1917	938	38,567
1896	4,161	77,584	1918	372	17,000
1897	1,711	35,235	1919	27	1,350
1898	1,144	21,725	1920	63	3,155
1899	305	7,861	1921	4	280
1900	1,192	23,775	1922	72	3,924
1901	1,920	41,075	1923	15	880
1902	3,502	112,437	1924	11	935
1903	4,854	134,642	1925	27	1,350
1904	3,977	161,752	1926		
1905	3,408	134,347	1927	41	2,057
1906	4,203	173,432			
1907	4,604	199,347	Totals	135,743	$5,317,945
1908	7,660	334,780			

*Figures for 1887-1892 (inc.) are for Sonoma County only, as none are available for other counties during that period though Solano County quarries were then also quite active.

Grinding Mill Pebbles.

Production of pebbles for tube and grinding mills began commercially in California in 1915. Owing to the decreased imports and higher prices of Belgium and other European flint pebbles, due to the war, there was a serious inquiry for domestic sources of supply. In 1916 and 1917 shipments totaled in excess of 20,000 tons per year; but they have since dropped to an insignificant figure. San Diego County has been the principal contributor, with some also from Fresno and Sacramento. Shipments have been made to metallurgical plants in California, Nevada, Montana and Utah.

Imports in 1927 amounted to 13,563 long tons, valued at $93,658 compared with 13,474 long tons and $120,078 in 1926.

California output for 1927 was 288 tons, valued at $1,800, an increase from the 1926 figures.

The amount and value of grinding mill pebbles, annually, follows:

Year	Tons	Value
1915	340	$2,810
1916	20,232	107,567
1917	21,450	90,538
1918	8,628	61,268
1919	2,607	19,272
1920	2,104	17,988
1921	247	1,418
1922	1,571	7,628
1923	2,650	14,936
1924	434	2,969
1925	215	1,385
1926	102	612
1927	288	1,800
Totals	60,868	$260,191

Sand and Gravel.

A considerable part of the gravel excavated is passed through grading and washing plants, and the material over 2 inches in size is crushed. Much of it is utilized in concrete mixtures. Most of the gravel used for road surfacing and repairs as well as that for railroad ballast is creek-run or pit-run material which is spread upon the roads without undergoing any grading or washing.

The distribution of the 1927 output of sand and gravel, by counties, is given in the following table:

County	Tons	Value
Alameda	[a] 1,696,707	$1,306,182
Butte	46,590	39,292
Contra Costa	[a] 138,883	78,703
Del Norte	5,000	6,750
Fresno	262,786	197,512
Glenn	44,598	39,689
Humboldt	283,504	46,810
Imperial	132,366	109,864
Kern	47,886	20,974
Lake	13,335	4,445
Lassen	103,500	36,950
Los Angeles	7,462,662	3,521,637
Mariposa	18,000	9,500
Merced	208,950	187,090
Monterey	221,363	220,584
Napa	48,580	45,690
Orange	172,989	105,948
Riverside	[a] 9,921	37,222
Sacramento	[a] 460,843	455,594
San Benito	49,938	14,329
San Bernardino	209,616	183,332
San Diego	[a] 946,212	674,280
San Joaquin	258,564	81,747
San Luis Obispo	[a] 17,541	8,369
San Mateo	17,027	9,036
Santa Barbara	70,497	40,473
Santa Clara	434,791	318,024
Santa Cruz	51,200	38,850
Shasta	16,913	14,402
Siskiyou	16,591	14,066
Sonoma	159,003	91,731
Stanislaus	344,016	211,255
Tehama	6,550	3,850
Trinity	1,500	2,250
Tuolumne	6,000	1,800
Ventura	[a] 287,051	375,972
Yolo	28,244	17,895
Yuba	152,500	198,688
El Dorado, Madera, Mendocino, Mono, Placer, San Francisco,[a] Sierra *	26,500	33,750
Totals	14,478,717	$8,804,535

* Combined to conceal output of a single operator in each.
[a] Includes molding sand.

Crushed Rock Production, by Counties, for 1927

County	Macadam and ballast		Rubble and riprap		Concrete		Unclassified		Total	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Alameda	90,662	$67,776			216,900	$82,392	[a]114,353	$81,667	421,915	$231,835
Alpine	10,200	5,100							10,200	5,100
Amador	11,000	10,100					[b]20	300	21,220	10,400
Butte	9,700	9,700			6,832	13,056	[c]84,526	68,555	101,058	91,311
Colusa	33,000	13,200							33,000	13,200
Contra Costa	210,793	170,007	5,886	$5,977	137,451	142,279	650,436	419,174	1,004,566	737,437
Del Norte	27,000	36,500	4,900	5,600			1,500	4,500	33,400	46,600
El Dorado	500	300							500	300
Humboldt	77,700	69,700	137,892	427,053	10,363	11,400			225,955	508,153
Imperial			95,969	19,794					95,969	19,794
Inyo	6,000	6,000							6,000	6,000
Lassen	12,525	10,935							12,525	10,935
Los Angeles	203,561	140,639	[e]33,445	95,790	1,310,419	1,102,462	670,101	1,431,550	2,217,526	2,770,441
Marin	15,000	30,000	93,460	121,498			194,127	229,758	302,587	381,256
Mariposa	68,165	12,170	266	1,237	45,757	212,770	[c]8,000	24,000	122,188	250,177
Mendocino	57,450	41,630							57,450	41,630
Merced	2,447	2,447							2,447	2,447
Modoc	203,302	61,651							203,302	61,651
Napa	8,707	11,850					183,339	152,456	192,046	164,306
Nevada	10,000	15,000							10,000	15,000
Orange	229,513	219,728							229,513	219,728
Placer	22,500	38,250	1,997	1,807					24,497	40,057
Riverside	30,700	53,100	874,667	874,466	449,920	279,255			1,355,287	1,206,821
Sacramento	15,000	7,500	378	212			343,759	290,900	359,137	298,612
San Bernardino	67,530	23,850	32,190	34,022	53,892	49,558	[a],f9,803	20,708	163,415	128,138
San Diego	8,000	4,800	150	188	107,984	206,035	4,150	2,539	120,284	213,562
San Luis Obispo	320,826	171,963	26,522	15,299					347,348	187,262
San Mateo	65,669	72,955	1,188	1,782	28,826	46,029			95,763	102,766
Santa Barbara	10,000	7,500					91,940	91,120	101,940	98,620
Santa Clara	6,940	5,455					149,185	134,224	156,125	139,679
Shasta	[g]216,955	113,493			5,989	6,783			222,944	120,276
Sierra	112,500	68,650							112,500	68,650
Siskiyou	176,119	68,362	5,000	5,000	10,000	15,000			191,119	88,362

Sonoma	75,771	57,269	160	160	450	450	55,582	59,143	131,963	117,022
Stanislaus	62,602	48,551							62,602	48,551
Tehama	1,000	600							1,000	600
Trinity	100,000	30,000							100,000	30,000
Tulare							24,724	15,082	24,724	15,082
Tuolumne	13,950	11,870					4,257	17,746	18,207	29,616
Ventura	30,750	36,900							30,750	36,900
Calaveras, Glenn, Kern, Monterey, San Benito, Sutter*	677,748	230,881							677,748	230,881
Fresno, Kern, San Benito, Santa Cruz, Solano*					845,639	1,037,131			845,639	1,037,131
Calaveras[d], Fresno, Glenn, Kern, San Francisco, Santa Cruz*							238,527	260,313	238,527	260,313
Totals	3,301,785	$1,986,382	1,314.150	$1,609,885	3,230,422	$3,204,600	2,828,329	$3,303,735	10,674,686	$10,104,602

* Combined to conceal output of a single operator in each.
[a] Includes red roofing granules.
[b] Includes roofing granules.
[c] Includes green granules for roofing and terrazzo.
[d] Includes greenstone roofing granules.
[e] Includes ornamental pebbles.
[f] Includes gannister.
[g] Includes smelter slag.

Included in the above is a total of 46,930 tons of molding sand, valued at $128,752 f. o. b. pit from two operators each in Riverside and San Diego counties, and one each in Alameda, Contra Costa, Sacramento, San Francisco, San Luis Obispo and Ventura. This item is each year assuming a more important position in the commercial mineral list of California. The 1926 figures totaled 46,601 tons and $105,336.

Crushed Rock.

To list the kinds and varieties of rock utilized commercially under this heading would be to run almost the entire gamut of the classification scale. Much depends on the kind available in a given district. Those which give the most satisfactory service are the basalts and other hard, dense, igneous rocks which break with sharp, clean edges. In many localities, river-wash boulders form an important source of such material. In such cases, combined crushing and washing plants obtain varying amounts of sand and gravel along with the crushed sizes. In Sacramento and Butte counties the tailings piles from the gold dredgers are the basis of like operations.

The values given are based on the selling prices, f. o. b. cars, barges, or trucks, at the quarry.

Miscellaneous Stone Production of California, by Years.

The amount and value, annually, of crushed rock (including macadam, ballast, rubble, riprap, and that for concrete), and sand and gravel, since 1893, follow:

Crushed Rock, Sand and Gravel, by Years

Year	Tons	Value	Year	Tons	Value
1893	371,100	$456,075	1912	8,044,937	$4,532,598
1894	661,900	664,838	1913	9,817,616	4,823,056
1895	1,254,688	1,095,939	1914	9,288,397	3,960,973
1896	960,619	839,884	1915	10,879,497	4,609,278
1897	821,123	600,112	1916	9,951,089	4,009,590
1898	1,177,365	814,477	1917	8,069,271	3,505,662
1899	964,898	786,892	1918	6,641,144	3,325,889
1900	789,287	561,642	1919	6,919,188	3,678,322
1901	530,396	641,037	1920	9,792,122	6,782,414
1902	2,056,015	1,249,529	1921	10,914,145	7,834,640
1903	2,215,625	1,673,591	1922	13,049,644	10,366,231
1904	2,296,898	1,641,877	1923	19,840,301	15,379,838
1905	2,624,257	1,716,770	1924	21,451,129	15,962,476
1906	1,555,372	1,418,406	1925	23,819,137	17,407,113
1907	2,288,888	1,915,015	1926	24,987,606	19,859,261
1908	3,998,945	3,241,774	1927	25,126,691	18,912,994
1909	5,531,561	2,708,326			
1910	5,827,828	2,777,690	Totals	241,005,902	$173,364,566
1911	6,487,223	3,610,357			

A comparison of the above table of annual production of these materials with the similar table for cement (see *ante*), reveals the fact that the important growth of the crushed rock and gravel business has been coincident with the rapid development of the cement industry from the year 1902.

CHAPTER FIVE

INDUSTRIAL MATERIALS

Bibliography: State Mineralogist Reports XII–XXIII (inc.). Bulletin 38. Min. & Sci. Press, Vol. 114, March 10, 1917. Spurr and Wormser, "Marketing of Metals and Minerals." "Non-Metallic Minerals," by R. B. Ladoo. See also under each substance.

The following mineral substances have been arbitrarily arranged under the general heading of 'Industrial Materials,' as distinguished from those which have a clearly defined classification, such as metals, salines, structural materials, etc.

These materials, many of which are mineral earths, are, with four or five exceptions, as yet produced on a comparatively small scale. The possibilities of development along several of these lines are large, and with increasing transportation and other facilities, together with steadily growing demands, the future for this branch of the mineral industry in California is promising. There is scarcely a county in the state but might contribute to the output.

Up to within the last few years, at least, production has been in the majority of instances dependent upon more or less of a strictly local market, and the annual tables show the results of such a condition, not only in the widely-varying amounts of a certain material produced from year to year, but in widely-varying prices of the same material.

The more important of these minerals thus far exploited, so far as shown by value of the output, are limestone, mineral water, pyrites, pottery clays, diatomaceous earth, gypsum, talc, dolomite, fuller's earth.

This group as a whole showed an increase in the total value to $5,258,068 in 1927 from $4,675,924 for 1926.

The following table gives the comparative figures for the amounts and value of industrial minerals produced in California during the years 1926 and 1927:

Substance	1926		1927		Increase+ Decrease— Value
	Amount	Value	Amount	Value	
Barytes	4,978 tons	$38,165	17,993 tons	$90,617	$52,452+
Clay (pottery)	797,461 tons	806,509	867,419 tons	872,661	66,152+
Dolomite	68,640 tons	119,313	45,976 tons	79,422	39,891—
Feldspar	7,300 tons	56,400	10,932 tons	86,101	29,701+
Fuller's earth	23,552 tons	250,192	13,018 tons	154,764	95,428—
Gems		9,049		7,035	2,014—
Gypsum	114,868 tons	211,337	94,630 tons	292,090	80,753+
Limestone	108,795 tons	367,501	699,790 tons	663,957	296,456+
Mineral paint	569 tons	5,846	*	*	* —
Mineral water	14,074,877 gals.	1,171,550	16,644,423 gals.	1,487,183	315,633+
Pumice and volcanic ash	7,170 tons	48,350	13,779 tons	168,896	120,546+
Pyrites	100,896 tons	466,088	130,910 tons	564,823	98,735+
Silica (sand and quartz)	30,010 tons	104,317	24,636 tons	94,762	9,555—
Soapstone and talc	17,004 tons	255,645	16,218 tons	164,744	90,901—
Unapportioned		[a]765,662		[b]651,013	114,649—
Total value		$4,675,924		$5,378,068	
Net increase					$702,144+

* Under 'Unapportioned'.

[a] Includes asbestos, diatomaceous earth, lithia, shale oil, sillimanite-andalusite-cyanite group.

[b] Includes asbestos, diatomaceous earth, graphite, lithia, mineral paint, shale oil, sillimanite-andalusite-cyanite group.

ASBESTOS

Bibliography: State Mineralogist Reports XII–XIX (inc.), XXII. Bulletins 38, 91. Canadian Dept. of M., Mines Branch Bulletin 69. Min. & Sci. Press, April 10, 1920, pp. 531-533. Eng. & Min. Jour.-Press, Vol. 113, pp. 617–625, 670–677. Asbestology, Vol. 5, No. 7, July, 1927.

In 1927 there was a small tonnage of crude asbestos ore and fibre produced in California, but as there was only a single operator, the figures are concealed under the 'Unapportioned' item.

The future of asbestos mining in California is dependent largely upon the development of uses in quantity for the short-fibre mill grades, and for the amphibole variety. There are apparently large resources of such material that can be made available. Some spinning-grade fibre has also been found in this state, notably in Nevada, Calaveras, and Monterey counties, but the commercial yield to date has been small. There are extensive serpentine areas in the Coast Ranges, in the Klamath Mountains, and in several sections of the Sierra Nevada which are within the range of possible asbestos producers, as chrysotile is a fibrous form of serpentine. These localities all yielded chromite in greater or less amounts during the World War period.

Three-quarters of the world's supply of asbestos was for many years produced by Canada.

At present, Rhodesia furnishes 60 per cent of the long fibre, though Canada in addition to its long fibre still accounts for practically the entire output of lower grades.

Asbestos Production of California, by Years.

Total amount and value of asbestos production in California since 1887, as given in the records of this Bureau, are as follows:

Year	Tons	Value	Year	Tons	Value
1887	30	$1,800	1909	65	$6,500
1888	30	1,800	1910	200	20,000
1889	30	1,800	1911	125	500
1890	71	4,260	1912	90	2,700
1891	66	3,960	1913	47	1,175
1892	30	1,830	1914	51	1,530
1893	50	2,500	1915	143	2,860
1894	50	2,250	1916	145	2,380
1895	25	1,000	1917	136	10,225
1896	----------	----------	1918	229	9,903
1897	----------	----------	1919 } * 1920 }	131	6,240
1898	10	200	1921	410	19,275
1899	30	750	1922	50	1,800
1900	50	1,250	1923	20	200
1901	110	4,400	1924	70	4,750
1902	----------	----------	1925 } * 1926 }	25	1,650
1903	----------	----------	1927	----------	*
1904	10	162			
1905	112	2,625			
1906	70	3,500			
1907	70	3,500	Totals	2,851	$135,375
1908	70	6,100			

*Annual details concealed under 'Unapportioned.'

BARYTES

Bibliography: State Mineralogist Reports XII, XIV, XV, XVII, XXI. Bulletin 38. Eng. & Min. Jour.-Press, Vol. 114, p. 109, July 15, 1922; Vol. 115, pp. 319-324, Feb. 17, 1923.

Commercial shipments of crude barytes in California in 1927

amounted to a total of 17,993 tons, valued at $90,617 f. o. b. rail-shipping point, being a marked increase in both quantity and value over the 1926 figures of 4978 tons and $38,165. The 1927 yield came from properties in Mariposa, Nevada and Orange counties. The barytes from Mariposa and Nevada counties was consumed principally in the manufacture of lithopone. That from Orange County was a furnace sinter, being a barytes gangue in a quicksilver ore, and was sold for use in oil-well drilling mud.

More than half of the total tonnage of barytes utilized in the United States is taken in the manufacture of lithophone, which is a chemically-prepared white pigment containing approximately 70% barium sulphate and 30% zinc sulphide. This is one of the principal constituents of 'flat' wall paints. Other important uses for barytes, after washing and grinding, are as an inert pigment and filler in paint, paper, linoleums, oilcloth and rubber manufacture, and in the preparation of a number of chemicals including barium binoxide, carbonate, chloride, nitrate, and the sulphate precipitated, or 'blanc fixe.'

Present quotations for barytes vary from $7 to $9 per ton, crude, f. o. b. rail-shipping point, depending on quality. Most baryte has to be washed and acid treated to remove iron stains or other impurities before being suitable for paint use.

Known occurrences of this mineral in California are located in Inyo, Los Angeles, Mariposa, Monterey, Nevada, San Bernardino, Shasta and Santa Barbara counties. The deposit at El Portal, in Mariposa County, has given the largest commercial production to date, in part witherite (barium carbonate, $BaCO_3$). Witherite has also been found in Shasta County, but no shipments have yet been made from the deposit.

Total Barytes Production of California.

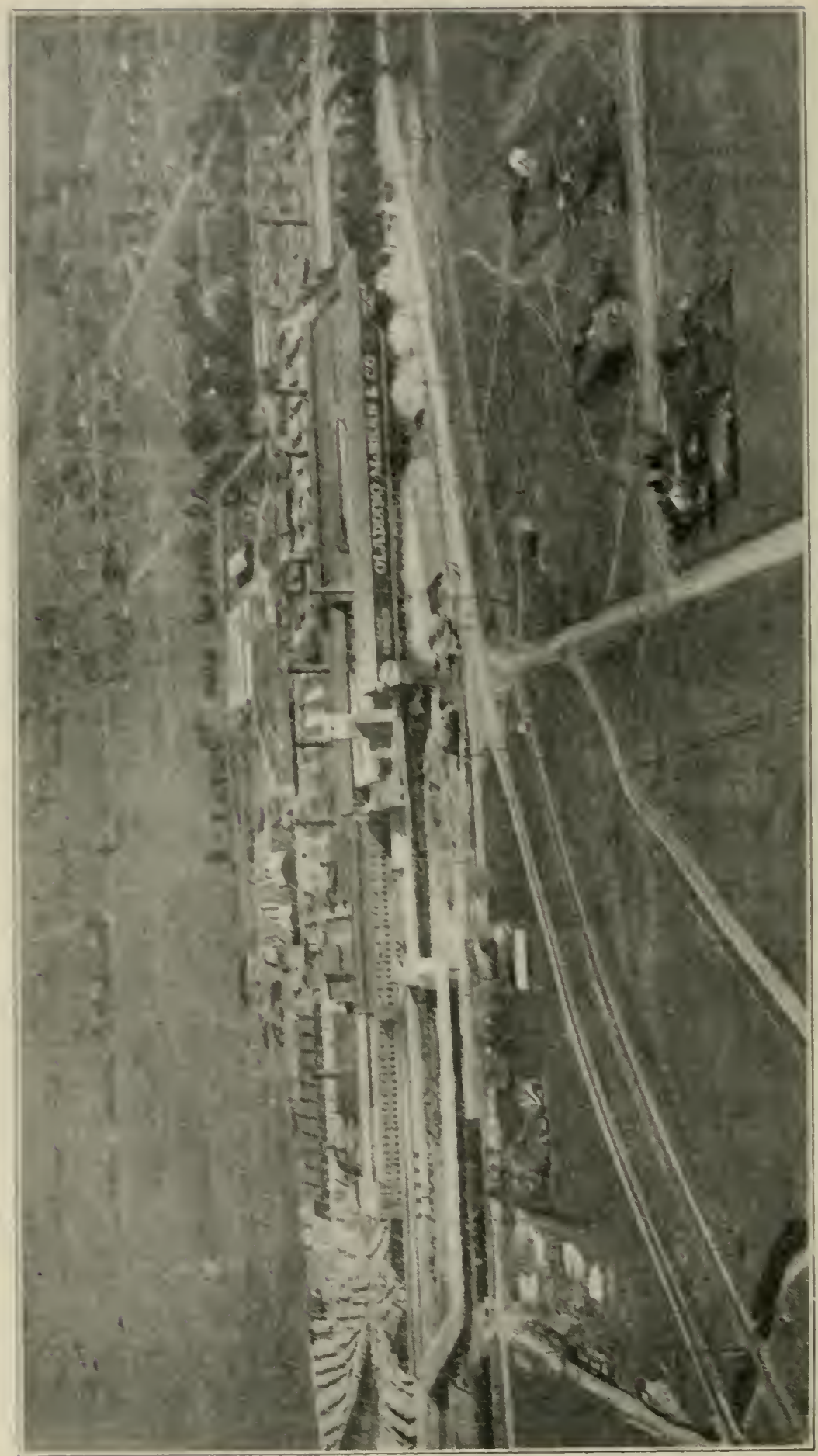
The first recorded production of barytes in California, according to the statistical reports of the State Mining Bureau, was in 1910. The annual figures are as follows:

Year	Tons	Value	Year	Tons	Value
1910	860	$5,640	1920	3,029	$20,795
1911	309	2,207	1921	901	4,809
1912	564	2,812	1922	3,370	18,925
1913	1,600	3,680	1923	2,925	16,058
1914	2,000	3,000	1924		
1915	410	620	1925		
1916	1,606	5,516	1926	4,978	38,165
1917	4,420	25,633	1927	17,993	90,617
1918	100	1,500			
1919	1,501	18,065	Totals	46,566	$258,042

CLAY (Pottery)

Bibliography: State Mineralogist Reports I, IV, IX, XII–XV, XVIII–XXIII (inc.). Bulletins 38, 99. Preliminary Report No. 7. U. S. Bureau of Standards, Tech. Paper No. 262.

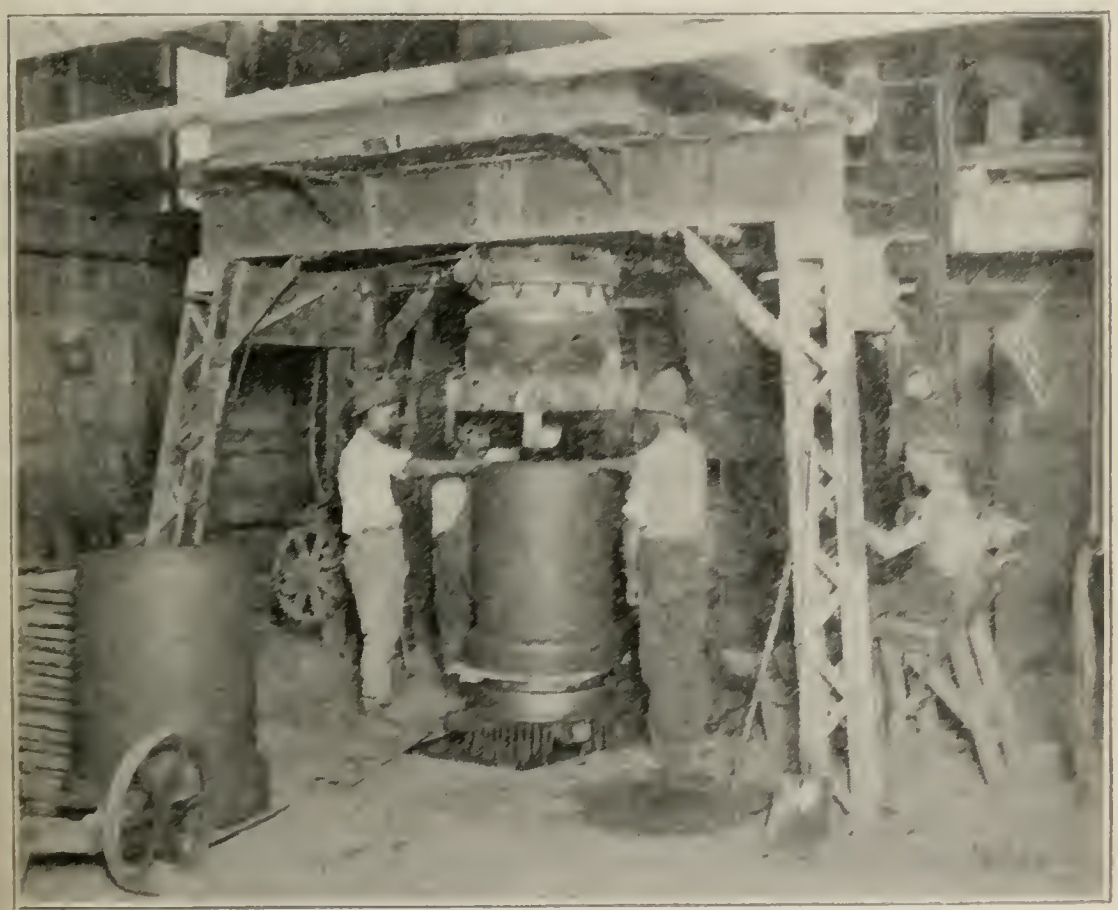
At one time or another in the history of the state, pottery clay has been mined in thirty-three of its counties. Of these, 21 contributed in 1926. In this report, 'pottery clay' refers to all clays used in the manufacture of red and brown earthenware, china and sanitary ware, flower pots, floor, faience and ornamental tiling, architectural terra cotta, sewer pipe, drain and roof tile, etc., and the figures for amount



Airplane view Cladding McBean & Co. plant at Lincoln, Placer Co. Photo by courtesy of the company.

and value are relative to the crude material at the pit, without reference to whether the clay was sold in the crude form or was immediately used in the manufacture of any of the above finished products by the producer. It does not include clay used in making brick and hollow building blocks.

There are many other important uses for clays besides pottery manufacture. Among these may be enumerated paper, cotton goods, and chemicals. Being neutral, clay does not have an injurious effect upon other constituents used in the manufacture of such articles. In paper making, clay is used as a filler in news and similar grades, and as a coater or glazer in the more highly-finished art papers. A large part



Sewer-pipe press, Los Nietos plant of Pacific Clay Products Co., Los Angeles County. Photo by courtesy of the company.

of the china clay used in the United States is imported from England. Clays of the montmorillonite and halloysite group ('rock soap') are being utilized successfully in the manufacture of soaps.

During 1927 a total of 63 producers in 21 counties reported an output of 867,419 short tons of pottery clay, having a total value of $872,661, f. o. b. rail-shipping point, for the crude material, as compared with the 1926 production of 801,461 tons worth $806,509.

Because of the fact that a given product often requires a mixture of several different clays, and that these are not all found in the same pit, it is necessary for most clay-working plants to buy some part of their raw materials from other localities. For these reasons, in compiling the clay industry figures, much care is required to avoid duplica-

tions. So far as we have been able to segregate the figures, from the data sent in by the operatives, we have credited the clay output to the counties from which the raw material originated; and have deducted tonnages used in brick manufacture, as bricks are classified separately, herein.

A tabulation of the direct returns from the producers, by counties, for the year 1927 is shown herewith:

Pottery Clay in 1927

County	Tons	Value	Used in the manufacture of
Alameda	6,593	$20,516	Architectural terra cotta, chimney, drain and sewer pipe, faience floor and roofing tile.
Amador	118,636	165,210	Architectural terra cotta, fire clay products and refractories, chimney and sewer pipe, drain, floor and roofing tile, and various.
Contra Costa	7,550	7,125	Conduit, red earthenware, drain, faience, floor and roofing tile.
Los Angeles	[a] [b] 147,621	206,175	Architectural terra cotta, conduit, red earthenware, refractories, drain, faience, floor and roofing tile, chimney and sewer pipe, art pottery and oil well mudding.
Monterey	1,100	550	Floor and roofing tile.
Orange	14,637	49,354	Stoneware, refractories, drain, floor and roofing tile, and various.
Placer	61,388	106,710	Architectural terra cotta, drain, chimney and sewer pipe, roofing and floor tile, sanitary and red earthenware, refractories, and various.
Riverside	118,514	198,330	Conduit, sewer pipe, red earthenware, refractories, floor and roofing tile, and various.
San Diego	[c] 16,190	31,765	Sewer pipe, faience, floor and roofing tile, and various.
Santa Clara	4,373	4,261	Sewer pipe, art pottery, drain, faience, floor and roofing tile, and various.
Ventura	[a] 354,418	63,120	Faience, floor and roofing tile, and oil well mudding.
Butte, Calaveras, Humboldt, Kern[a], Merced, Mono, Sacramento, San Bernardino, San Luis Obispo and Stanislaus*	16,399	19,545	Architectural terra cotta, chimney, drain, floor and roofing tile, and flue lining, loam, sewer pipe, and oil well mudding.
Totals	867,419	$872,661	

* Combined to conceal output of a single operator in each.
[a] Includes clay and shale for oil well mudding.
[b] Includes silt.
[c] Includes "Cornwall stone."

Pottery Clay Products.

The values of the various pottery clay products made in California during 1927 totaled $14,739,689, compared with $14,625,203 in 1926, their distribution being shown in the following tabulation:

Product	*Number of producers*	*Tons*	*Value*
Architectural terra cotta, chimney pipe and flue lining	10	28,517	$2,439,371
Drain pipe	12	6,987	128,258
Roofing tile	25	75,014	1,865,970
Sewer pipe	8	104,833	2,934,304
Chinaware, semi-vitreous tableware	3	------	528,750
Sanitary ware	6	------	1,903,743
Red earthenware	6	------	181,631
Stoneware and chemical stoneware	6	------	443,053
Floor, faience, mantel, glazed, and hand-made tile	30	------	3,038,501
Miscellaneous art pottery, art tile, bath tile, decorative stands and tile, conduit pipe, electrical porcelain, segment blocks, garden furniture and pottery, glass-tank blocks, radiator and stove backs, ground clay, fireclay and cement, grog, and various	27	------	1,276,108
Total value			$14,739,689

Important increases were shown in flat tile (floor, faience, mantel, etc.), sewer pipe, sanitary ware, and the miscellaneous group, with decreases by architectural terra cotta, chimney pipe and roofing.

Pottery Clay Production of California, by Years.

Amount and value of crude pottery clay output in California since 1887 are given in the following table:

Year	Tons	Value	Year	Tons	Value
1887	75,000	$37,500	1908	208,042	$325,147
1888	75,000	37,500	1909	299,424	465,647
1889	75,000	37,500	1910	249,028	324,099
1890	100,000	50,000	1911	224,576	252,759
1891	100,000	50,000	1912	199,605	215,683
1892	100,000	50,000	1913	231,179	261,273
1893	24,856	67,284	1914	179,948	167,552
1894	28,475	35,073	1915	157,866	133,724
1895	37,660	39,685	1916	134,636	146,538
1896	41,907	62,900	1917	166,298	154,602
1897	24,592	30,290	1918	112,423	166,788
1898	28,947	33,747	1919	135,708	245,019
1899	40,600	42,700	1920	203,997	440,689
1900	59,636	60,956	1921	225,120	362,172
1901	55,679	39,144	1922	277,232	473,184
1902	67,933	74,163	1923	376,863	697,841
1903	90,972	99,907	1924	417,928	651,857
1904	84,149	81,952	1925	537,587	674,376
1905	133,805	130,146	1926	801,461	806,509
1906	167,267	162,283	1927	867,419	872,661
1907	160,385	254,454			
			Totals	7,578,203	$9,315,304

DIATOMACEOUS EARTH

Bibliography: State Mineralogist Reports II, XII–XV (inc), XVII–XXII (inc.). Bulletins 38, 67, 91. Am. Inst. Min. Eng., Bull. 104, August, 1915, pp. 1539–1550. U. S. Bur. of Mines, Rep. of Investigations: Serial No. 2431, Jan., 1923. Eng. & Min. Jour.-Press, Vol. 115, pp. 1152–1154, June 30, 1923.

Infusorial and diatomaceous earths—sometimes called tripolite—are very light and extremely porous, chalk-like materials composed of pure silica (chalk, being calcareous) which have been laid down under water and consist of the remains of microscopical infusoria and diatoms. The former are animal remains, and the latter are from plants. The principal commercial use of diatomaceous earth (also called 'diatomite') is as an absorbent. It is also employed in the manufacture of scouring soap and polishing powders; for filtration purposes; in making some classes of refractory brick; and as an insulating medium both in heating and refrigeration. It is a first-class nonconductor of heat, where high temperatures are employed, such as around steel and gas plants and power houses. In such cases, it is built in as an insulating layer in furnace walls. In Germany, under the name 'kieselguhr,' it was used as an absorbent for nitroglycerine in the early manufacture of dynamite.

As a nonconductor of heat it has been used alone or with other materials as a covering for boilers, steam pipes and safes, and in fireproof cement. It is used largely by paint manufacturers as a wood filler. Boiled with shellac it is made into records for talking machines. It has been used for absorbing liquid manures so that they could be utilized as fertilizers, and as a source of silica in making water-glass as well as in the manufacture of cement, tile glazing, artificial stone, ultramarine and other pigments of aniline and alizarine colors, paper filling, sealing wax, fireworks, hard-rubber objects, matches, and paper maché, and

for solidifying bromine. For making insulating brick the material is sawed into blocks, and for all other purposes it is ground and screened.

The most important deposits in California thus far known are located in Monterey, Orange, San Luis Obispo, and Santa Barbara counties. The Santa Barbara material is diatomaceous and is of a superior quality, particularly for filtration uses which bring the higher prices. Infusorial or diatomaceous earths are also found in Fresno, Kern, Los Angeles, Plumas, San Benito, San Bernardino, San Joaquin, Shasta, Sonoma, and Tehama counties.

As almost 90% of the output in California is from a single operator, we have concealed the exact figures under the 'Unapportioned' item in the state and county totals. There were six operators in 1927 in Los Angeles, Monterey, Santa Barbara and Shasta counties, the shipments showing a decrease in tonnage and value compared with 1926.

The material shipped was utilized for insulation, filtration, paint pigment, cement admixture, and for clarification of gasoline and kerosene.

Total Production of Diatomaceous Earth in California.

The first recorded production of these materials in California occurred in 1889; total amount and value of output, to date, are as follows:

Year	Tons	Value	Year	Tons	Value
1889	39	$1,335	1910	1,843	$17,617
1890			1911	2,194	19,670
1891			1912	4,129	17,074
1892			1913	8,645	35,968
1893	50	2,000	1914	12,840	80,350
1894	51	2,040	1915	12,400	62,000
1895			1916	15,322	80,619
1896			1917	24,301	127,510
1897	5	200	1918	35,963	189,459
1898			1919	40,200	217,800
1899			1920	60,764	1,056,260
1900			1921		
1901			1922	*90,739	1,016,675
1902	422	2,532	1923		
1903	2,703	16,015	1924	*193,064	5,729,736
1904	6,950	112,282	1925		
1905	3,000	15,000	1926	*	*
1906	2,430	14,400	1927	*	*
1907	2,531	28,948			
1908	2,950	32,012	Totals	524,035	$8,881,032
1909	500	3,500			

*Annual details concealed under 'Unapportioned.'

DOLOMITE

Bibliography: Reports XV, XVII–XXII (inc.). Bulletins 67, 91.

The production of dolomite for the year 1927 totaled 45,976 tons valued at $79,422, being decreases in both quantity and value from the 1926 figures of 68,640 tons and $119,313. The 1927 output came from a single quarry each in Inyo and Monterey counties. The material shipped was utilized for steel furnace flux and refractories, and for manufacture of CO_2. Some previously has been used for burned dolomitic lime, for stucco dash-coat, and terrazzo.

Dolomite Production of California, by Years.

Previous to the 1915 statistical report of the State Mining Bureau, dolomite was included under limestone, as the two minerals are closely related chemically; but since dolomite, as such, has been found to have certain distinctive applications, we here give it a separate classification.

Amount and value of the output of dolomite, annually, have been as follows:

Year	Tons	Value
1915	4,192	$14,504
1916	13,313	46,566
1917	27,911	66,416
1918	24,560	79,441
1919	24,502	67,953
1920	42,388	132,791
1921	31,195	99,155
1922	52,409	114,911
1923	69,519	142,615
1924	28,843	71,271
1925	42,852	104,900
1926	68,640	119,313
1927	45,976	79,442
Totals	476,300	$1,139,278

FELDSPAR

Bibliography: State Mineralogist Reports XV, XVII, XVIII, XXI. Bulletins 67, 91. U. S. Bureau of Mines, Bulletin 92. Eng. & Min. Jour.-Press, Vol. 115, pp. 535–538, Mar. 24, 1923.

Feldspar was produced by four operators in three counties (Kern, Riverside and San Diego) during 1927, to the amount of 10,932 tons, valued at $86,101, being a slight increase both in quantity and value over the 1926 figures, which were 7300 tons and $56,400.

The requirements of the pottery trade demand that in general the percentage of free silica associated with the feldspar be less than 20%, and in some cases the potters specify less than 5%. An important factor, also, is the iron-bearing minerals frequently present in pegmatites and granites, such as biotite (black mica), garnet, hornblende, and black tourmaline. Feldspar for pottery uses should be practically free of these. The white, potash-mica, muscovite, is not particularly objectionable except that, being in thin, flexible plates, it does not readily grind to a fineness required for the feldspar.

Present quotations are from $5 to $9 per ton, crude, according to quality.

The most important developments quantitatively in the feldspar resources of California have thus far taken place in San Diego and Riverside counties, where large deposits of massive, high-grade spar are being opened up. These deposits are unusually free from black mica and other deleterious iron-bearing minerals objectionable in pottery work. The important producing districts are near Lakeside and Campo, in San Diego County, and near Lakeview, Murrietta, and Elsinore, in Riverside County. Other deposits which give promise are

reported from Inyo, Kern and San Bernardino counties. No recent shipments have been reported from Monterey and Tulare counties, formerly important sources.

Total Feldspar Production of California.

Total amount and value of feldspar production in California since the inception of the industry are given in the following table, by years:

Year	Tons	Value	Year	Tons	Value
1910	760	$5,720	1920	4,518	26,189
1911	740	4,560	1921	4,349	28,343
1912	1,382	6,180	1922	4,587	37,109
1913	2,129	7,850	1923	11,100	81,800
1914	3,530	16,565	1924	9,055	68,112
1915	1,800	9,000	1925	8,165	59,615
1916	2,630	14,350	1926	7,300	56,400
1917	11,792	46,411	1927	10,932	86,101
1918	4,132	22,061			
1919	1,272	12,965	Totals	91,173	$589,326

FLUORSPAR

Bibliography: State Mineralogist Reports XVII, XVIII. Bulletins 67, 91. Eng. & Min. Jour.-Press, Vol. 117, pp. 489–492, Mar. 22, 1924.

Fluorspar, or calcium fluoride, CaF_2, is one of the most important non-metallic minerals from an industrial standpoint. About 80% of the commercial mineral is prepared in the 'gravel' form and utilized as a flux in the manufacture of steel, for which use no substitute has yet been found. In the United States, under normal business conditions, the consumption for that purpose is 125,000 to 150,000 tons annually. Fluorspar is also used in aluminum smelting, and in the manufacturing of enameled ware, glazed tile and brick, opalescent glass and certain chemicals, particularly hydrofluoric acid and its derivatives. The mineral is marketed in three forms: lump, gravel, and ground.

According to the U. S. Bureau of Foreign and Domestic Commerce, imports of fluorspar into the United States in 1926 amounted to 67,563 long tons, valued at $747,237, and came principally from England, with smaller amounts from British South Africa, Italy, China and Netherlands. Domestic shipments of fluorspar, according to the U. S. Bureau of Mines, totaled 128,657 short tons, valued at $2,341,277.

In California deposits have been reported in Los Angeles, Mono, Riverside and San Bernardino counties, but no commercial production has resulted except in 1917–1918, when a total of 79 tons valued at $991 was shipped from Riverside County.

The Tariff Act of 1922 places a duty of $5.60 per ton on foreign importations of fluorspar.

Present quotations (Engineering and Mining Journal, New York) are f.o.b. Middle Western Mines, per net ton: Gravel, not less than 85% CaF_2 and not over 5% SiO_2, $17; foundry lump, $18.

FULLER'S EARTH

Bibliography: State Mineralogist Reports XIV, XVII, XVIII, XXI. Bulletins 38, 91. U. S. Bureau of Mines, Bulletin 71. Eng. & Min. Jour.-Press, Vol. 121, pp. 837–842, May 22, 1926.

Fuller's earth includes many kinds of unctuous clays. It is usually soft, friable, earthy, nonplastic, white and gray to dark green in color, and some varieties disintegrate in water. In California, fuller's earth has been used in clarifying both refined mineral and vegetable oils, and for special chemical purposes; although its original use was in fulling wool, as the name indicates. Production has come mainly from Calaveras and Solano counties, with other deposits noted also in Riverside, Fresno, Inyo and Kern counties.

Clays of the montmorillonite and hallosite group ('rock soap') are being utilized by some of the oil refineries in lieu of true fuller's earth in the refining of petroleum products.

The production of 13,018 tons valued at $154,764 here credited to 1927 as 'fuller's earth' is in reality colloidal clay of the montmorillonite class (sold under such local names as 'bentonite,' 'otaylite,' 'shoshonite,' derived from the locality where found). Because of its being utilized for clarifying, filtering, and cleanser purposes, most of it in petroleum refining, we have placed it, for the purpose of the State Division of Mines and Mining statistical reports, under the fuller's earth heading.

After all, the practical test of a fuller's earth is not so much chemical, as a physical one; that is, its physical capacity to absorb basic colors and to remove these colors from solution in animal, vegetable, or mineral oils, also from water.

The 1927 output above noted is a decrease in both amount and value from the 23,552 tons and $250,192 in 1926, and came from five properties, in Inyo, Kern, San Bernardino, and San Diego counties.

Fuller's Earth Production of California, by Years.

Fuller's earth was first produced commercially in this state in 1899, and the total amount and value of the output since that time are as follows:

Year	Tons	Value	Year	Tons	Value
1899	620	$12,400	1915	692	$4,002
1900	500	3,750	1916	110	550
1901	1,000	19,500	1917	220	2,180
1902	987	19,246	1918	37	333
1903	250	4,750	1919	385	3,810
1904	500	9,500	1920	600	6,000
1905	1,344	38,000	1921	1,185	8,295
1906	440	10,500	1922	6,606	48,756
1907	100	1,000	1923	3,650	55,125
1908	50	1,000	1924	5,290	67,295
1909	459	7,385	1925	5,280	91,842
1910	340	3,820	1926	23 552	250,192
1911	466	5,294	1927	13,018	154,764
1912	876	6,500			
1913	460	3,700	Totals	69,777	$845,417
1914	760	5,928			

NOTE.—Above production since 1921 has been montmorillonite (hydrous aluminum silicate) a colloidal clay, sometimes called 'rock soap' and 'bentonite,' and in part locally called 'shoshonite' from its being found near Shoshone in Inyo County; and in part 'otaylite' from Otay, San Diego County.

GEMS

Bibliography: State Mineralogist Reports II, XIV, XV, XVII, XVIII, XX, XXI. Bulletins 37, 67, 91. U. S. G. S., 'Mineral Resources of the U. S.'; Bull. 603, p. 208. Bull. Dept. Geol. Univ. of Cal., Vol. 5, pp. 149–153, 331–380. Am. Jour. Sci., Vol. 31, p. 31.

The production of gem materials in California has been somewhat irregular and uncertain since 1911. The compilation of complete statistics is difficult owing to the widely scattered places at which stones are gathered and marketed for the most part in a small way. The material reported in 1927 totaled $7,035 in value, compared with $9,049 in 1926, the decrease being due mainly to San Diego County.

The following table shows the distribution of rough, uncut gem and jeweler's materials during 1927:

County	*Value*	*Kind*
Butte	$275	Jade (Californite), diamonds.
San Diego	3,500	Tourmaline, kunzite, golden and pink beryl, topaz, quartz crystals, spessartite and pyrope garnets, and indicolite.
Calaveras	* 3,260	Quartz crystals.
El Dorado		Quartz crystals.
San Bernardino		Agate and topaz.
Total value	$7,035	

* Combined to conceal output of a single operator in each.

Varieties of California's Gem Stones.

Diamonds have been found in a number of localities in California; but in every case, they have been obtained in stream gravels while working them for gold. The principal districts have been: Volcano in Amador County; Placerville, Smith's Flat and others in El Dorado County; French Corral, Nevada County; Cherokee Flat, Morris Ravine, and Yankee Hill, Butte County; Gopher Hill and upper Spanish Creek, Plumas County. The most productive district of recent years has been Cherokee in Butte County.

California *tourmalines* are decidedly distinctive in coloring and 'fire' as compared to foreign stones of this classification. The colors range from deep ruby to pink, and various shades of green, also blue.

One of our California gem stones, *benitoite*, has not been found elsewhere; and in but a single locality here: The Dallas Mine in San Benito County.

Kunzite, a gem variety of spodumene, was first found in the Pala district in San Diego County. It has thus far been found in only one locality (Madagascar) outside of California. It is of a lilac color, and is described in detail in Bulletin 37 of the State Mining Bureau.

Beryls of excellent fire and delicate colors are also obtained in the Pala district, of which the *aquamarine* (blue) and *morganite* (pink) varieties deserve special mention. Morganite, like kunzite, has thus far been found elsewhere only in Madagascar.

Californite, or 'California jade,' is a gem variety of *vesuvianite,* and is green or white in color. It is found in Butte, Fresno, and Siskiyou counties.

Stones of precious blue *topaz* of fine quality are being cut from crystals mined in northern San Diego County. They are associated with beryl and blue tourmaline.

Some *rhodonite* has been mined in Siskiyou County, and used for decorative purposes, its value being included in the marble figures.

Garnets are found in a number of localities in California; the important yield of gems being *hyacinth* and *spessartite* varieties from San Diego County.

Chrysoprase has been produced in Tulare County.

Turquoise has been found in the desert section of San Bernardino County, but none produced commercially in recent years.

Sapphires have been reported found in San Bernardino and Riverside counties, but not as yet confirmed. A few have been found in stream gravels with diamonds in Butte County.

Rubies have been identified by the laboratory of the State Mining Bureau, occurring in limestone from the Baldy Mountains, San Bernardino County. Thus far no stones of commercial size have been taken out.

Total Production of Gem Materials in California.

The value of the gem output in California annually since the beginning of commercial production is as follows:

Year	Value	Year	Value
1900	$20,500	1915	$3,565
1901	40,000	1916	4,752
1902	162,100	1917	3,049
1903	110,500	1918	650
1904	136,000	1919	5,425
1905	148,500	1920	36,056
1906	497,090	1921	10,954
1907	232,642	1922	1,312
1908	208,950	1923	13,220
1909	193,700	1924	4,800
1910	237,475	1925	10,663
1911	51,824	1926	9,049
1912	23,050	1927	7,035
1913	13,740		
1914	3,970	Total	$2,190,571

GRAPHITE

Bibliography: State Mineralogist Reports XIII, XIV, XV, XVII. Bulletins 67, 91. U. S. G. S., Min. Res., 1914, Pt. II.

Graphite (also called plumbago) has been produced from time to time in the state, coming principally from Sonoma and Los Angeles counties. It is difficult for these deposits, which must be concentrated, to compete with foreign supplies, which go on the market almost directly as they come from the deposit. Graphite ores are concentrated with considerable difficulty, and the electric process of manufacturing artificial graphite from coal has been perfected to such a degree that only deposits of natural graphite of a superior quality can be exploited with any certainty of success.

According to the U. S. Geological Survey, operators in this country who are working disseminated flake deposits must depend on their No. 1 and No. 2 flake for their profit. Graphite dust is merely a by-product and is salable only at a low price.

The principal value of graphite is on account of its infusibility and resistance to the action of molten metals. It is also largely used in the manufacture of electrical appliances, of 'lead' pencils, as a lubricant, as stove polish, paints, and in many other ways. Amorphous graphite, commonly carrying many impurities, brings a much lower price. For some purposes, such as foundry facings, etc., the low-grade material is satisfactory. Among the interesting uses for graphite is the prevention of formation of scale in boilers. The action is a mechanical one. Being soft and slippery, the graphite prevents the particles of scale from adhering to one another or to the boiler and they are thus easily removed.

The price increases with the grade of material, the best quality crystalline variety being quoted at present (f.o.b. New York) at 7½¢–8¢ per pound (Ceylon lumps).

The coarser flakes are necessary for crucibles, as they help to bind the clay together in addition to their refractory service. Imports in 1927 from Ceylon, Canada, Madagascar, Mexico and Korea, totaled 17,429 short tons valued at $722,004 compared with 16,194 tons valued at $923,513 in 1926.

Occurrence of graphite has been reported at various times from Calaveras, Fresno, Imperial, Inyo, Los Angeles, Mendocino, San Bernardino, San Diego, Siskiyou, Sonoma and Tuolumne counties.

During 1927 there was a small commercial output of graphite from Los Angeles County. For several years a single plant in Los Angeles County has been concentrating graphite from a disseminated ore, the product being used for paint and for foundry facing.

Graphite Production of California, by Years.

According to the records of the State Mining Bureau, the graphite production of California, by years, has been as follows:

Year	*Pounds*	*Value*
1901	128,000	$4,480
1902	84,000	1,680
1903	-------	------
1913	2,500	25
1914	-------	------
1915	-------	------
1916	29,190	2,335
1917		
1918	*770,000	37,225
1919		
1920		
1921	*624,000	26,160
1922		
1923	-------	------
1925		
1926	*76,000	13,120
1927		
Totals	2,113,690	$85,025

* Annual details concealed under 'Unapportioned,' on account of a single producer.

GYPSUM

Bibliography: State Mineralogist Reports XIV, XV, XVII, XVIII, XXII. Bulletins 38, 67, 91. U. S. Geol. Surv., Bull. 223, 413, 430, 697. U. S. Bur. of Standards, Circular No. 281.

During 1927 one operator each in Imperial and Kern counties and two in Riverside produced a total of 94,630 tons of gypsum, valued at $292,090, compared with 114,868 tons and $211,337 in 1926. The material was utilized mainly in cement manufacture as a retardant, for hard-wall plaster (including wall board), and for fertilizer.

Uses.

The most important use of gypsum from the quantity standpoint is in the calcined form where it is utilized in the manufacture of various hard-wall plasters and plaster board. As plaster of paris, it plays a very important part in surgical work. Approximately 2%, by weight, raw gypsum is added in the manufacture of Portland cement just before the final grinding. In this application, the gypsum acts as a retarder to the set of the cement. The use of gypsum tile for non-bearing fireproof partitions, stairway and elevator enclosures, and the protection of steel columns, girders and beams, has increased greatly.

Keene's cement is a gypsum product, calcined to complete dehydration, and an accelerator added such as alum, potassium sulphate, borax, aluminum sulphate.

Land plaster may be applied to the soil by drilling, or scattered in the hill, or it may be sowed broadcast, in quantities ranging from 200 to 500 pounds to the acre.

Total Production of Gypsum in California.

Production of gypsum annually in California since such records have been compiled by this Bureau is as follows:

Year	Tons	Value	Year	Tons	Value
1887	2,700	$27,000	1909	30,700	$138,176
1888	2,500	25,000	1910	45,294	129,152
1889	3,000	30,000	1911	31,457	101,475
1890	3,000	30,000	1912	37,529	117,388
1891	2,000	20,000	1913	47,100	135,050
1892	2,000	20,000	1914	29,734	78,375
1893	1,620	14,280	1915	20,200	48,953
1894	2,446	24,584	1916	33,384	59,533
1895	5,158	51,014	1917	30,825	56,840
1896	1,310	12,580	1918	19,695	37,176
1897	2,200	19,250	1919	19,813	50,579
1898	3,100	23,600	1920	20,507	92,535
1899	3,663	14,950	1921	37,412	78,875
1900	2,522	10,088	1922	47,084	188,336
1901	3,875	38,750	1923	86,410	289,136
1902	10,200	53,500	1924	25,569	53,210
1903	6,914	46,441	1925	107,613	172,444
1904	8,350	56,592	1926	114,868	211,337
1905	12,859	54,500	1927	94,630	292,090
1906	21,000	69,000			
1907	8,900	57,700	Totals	1,023,732	$3,184,889
1908	34,600	155,400			

LIMESTONE

Bibliography: State Mineralogist Reports IV, XII–XV (inc.), XVII–XXIII (inc.). Bulletins 38, 91. Oregon Agr. College, Extension Bulletin 305. Eng. and Min. Jour.-Press, Vol. 120, pp. 249–253.

'Industrial' limestone was produced in nine counties during 1927, to the amount of 699,790 tons, valued at $663,957, being an increase both in quantity and value compared to the 1926 output of 108,795 tons, worth $367,501.

The amount here given does not include the limestone used in the manufacture of cement nor for macadam and concrete, nor of lime for building purposes; but accounts for that utilized as a smelter and foundry flux, for glass and sugar making, and other special chemical and manufacturing processes. It also includes that utilized for fertilizers (agricultural 'lime'), 'roofing gravel,' paint and concrete filler, whiting for paint, putty, kalsomine, terrazzo, paving dust, chicken grit, carbon dioxide gas, 'paving compound,' facing dust for concrete pipe, also for rubber and magnesite mix. That from Santa Clara and Los Angeles counties is calcareous marl sold for agricultural purposes. Of the total product in 1927, approximately 23,183 tons, valued at $41,096, were used for agricultural purposes.

Distribution of the 1927 output was as follows:

County	*Tons*	*Value*
El Dorado	96,733	$146,506
San Bernardino	548,011	348,384
Santa Cruz	16,717	38,045
Tulare	21,774	77,000
Contra Costa, Los Angeles, Riverside, San Mateo, Shasta*	16,555	54,022
Totals	699,790	$663,957

* Combined to conceal output of a single operator in each.

Limestone Production of California, by Years.

The following tabulation gives the amounts and value of 'industrial' limestone produced in California by years since 1894 when compilation of such records was begun by the State Mining Bureau. These tonnages consist principally of limestone utilized for flux, glass and sugar making, agricultural, chemical, and other special industrial purposes. That utilized in cement manufacture is not included.

Year	Tons	Value	Year	Tons	Value
1894	15,420	$19,275	1912	613,375	$570,248
1895	71,355	71,690	1913	301,918	274,455
1896	68,184	71,112	1914	572,272	517,713
1897	36,796	38,556	1915	146,324	156,288
1898	27,686	24,548	1916	187,521	217,733
1899	30,769	29,185	1917	237,279	356,396
1900	32,791	31,532	1918	208,566	456,258
1901	76,937	99,445	1919	88,291	248,145
1902	71,422	90,524	1920	90,120	298,197
1903	125,919	163,988	1921	75,921	305,912
1904	40,207	87,207	1922	84,382	282,181
1905	192,749	323,325	1923	143,266	348,464
1906	80,262	162,827	1924	219,476	582,660
1907	230,985	406,041	1925	319,977	494,525
1908	273,890	297,264	1926	108,795	367,501
1909	337,676	419,921	1927	699,790	663,957
1910	684,635	581,208			
1911	516,398	452,790	Totals	7,011,354	$9,511,071

LITHIA

Bibliography: State Mineralogist Reports II, IV, XIV, XXI, Bulletins 38, 67, 91.

Lithia mica, lepidolite (a silicate of lithium et al.) utilized in the manufacture of artificial mineral water, fireworks, glass, etc., has been mined in San Diego County since 1899, except between 1905 and 1915, though there was none shipped in 1923 and 1925. The 1927 figures are concealed under the 'Unapportioned' item. Some amblygonite, a lithium phosphate, is occasionally also obtained from pockets associated with the gem tourmalines.

Lithia mica total production in the state has been as follows:

Year	Tons	Value	Year	Tons	Value
1899	124	$4,600	1919	800	$14,400
1900	440	11,000	1920	10,046	153,502
1901	1,100	27,500	1921	*1,365	20,781
1902	822	31,880	1922		
1903	700	27,300	1923		
1904	641	25,000	1924	109	2,269
1905	25	276	1925		
1906			1926	*540	13,500
1915	91	1,365	1927		
1916	71	1,065			
1917	880	8,800	Totals	21,865	$417,236
1918	4,111	73,998			

*Annual details concealed under 'Unapportioned.'

MICA

Bibliography: State Mineralogist Reports II, IV. Bulletins 38, 67, 91. U. S. Geol. Surv., Bull. 740; Min. Res. of U. S. Eng. & Min. Jour.-Press, Vol. 115, pp. 55–60, Jan. 13, 1923.

No commercial production of mica has recently been reported in California. Production in previous years has been as follows:

Year	*Tons*	*Value*
1902	50	$2,500
1903	50	3,800
1904	50	3,000
Totals	150	$9,300

Classification and Uses.

Practically all marketable mica is of the muscovite or phlogopite varieties. There are three main commercial classes: Sheet mica, including punch; splittings, and scrap. Sheet mica is used chiefly for electrical purposes and for glazing; splittings are made into built-up mica; scrap is ground to a powder. Mica to be classified as sheet must yield a rectangle of at least $1\frac{1}{2} \times 2$ in., must split evenly and freely, be free from cracks, rulings, or plications, and reasonably free from inclusions of foreign matter, though stains of a nonconducting character are permissible for some uses. Ability to withstand heat and high electrical resistance have led to a wide application of sheet mica in the electrical industries. The electrical uses of sheet mica greatly exceed all others in quantity and value of the material used.

As a heat-resisting transparent medium, sheet mica has various uses. It is widely employed for stove windows, though this use has declined

to a considerable extent. A hard and rigid mica that is nearly clear is best suited for stove fronts. High-grade stove mica commands a higher price than electrical mica, because for the most part larger sizes are demanded. Mica is also used in furnace and bake-oven sight-holes, heat screens, lamp chimneys, canopies and shades, particularly for gas mantles, and also for military lanterns and in lantern slides.

Its ability to withstand shocks and strains, combined with its transparency, has led to wide use in motor goggles, spectacles, divers' helmets, smoke helmets, compass cards, gage fronts, and in windows subject to shock, as in the conning towers of warships. On account of its heat-resisting qualities, ground mica is used in railroad car axle packings, in pipe and boiler coverings, in fire-proof paints, and in rubber tires. Ground mica is used as a component in roofing, as a filler in rubber and other products, in calico printing, and as a tire powder. It is used also in tinsel decorations, and as 'Santa Claus snow' for Christmas tree and window decorations. It is used as a lubricant for wooden bearings, and mixed with oil for metal bearings.

MINERAL PAINT

Bibliography: State Mineralogist Reports XII–XIX (inc.), XXI, XXII. Bulletins 38, 91.

Mineral paint material was produced in California in 1927 by a single operator in Stanislaus County. This material was a yellow ochre. There was a slight decline in both quantity and value from the 1926 production.

Mineral Paint Production of California, by Years.

The first recorded production of mineral paint materials in the state was in the year 1890. The output, showing annual amount and value since that time, is given herewith:

Year	Tons	Value	Year	Tons	Value
1890	40	$480	1910	200	$2,040
1891	22	880	1911	186	1,184
1892	25	750	1912	300	1,800
1893	590	26,795	1913	303	1,780
1894	610	14,140	1914	132	847
1895	750	8,425	1915	311	1,756
1896	395	5,540	1916	643	3,960
1897	578	8,165	1917	520	2,700
1898	653	9,698	1918	728	4,738
1899	1,704	20,294	1919	1,780	17,055
1900	529	3,993	1920	779	8,477
1901	325	875	1921	446	4,748
1902	589	1,533	1922	1,620	13,277
1903	2,370	3,720	1923	1,049	11,773
1904	270	1,985	1924	532	5,234
1905	754	4,025	1925	669	6,969
1906	250	1,720	1926	569	5,846
1907	250	1,720	1927	*	*
1908	335	2,250			
1909	305	2,325	Totals	21,511	$206,697

* Under 'Unapportioned.'

MINERAL WATER.

Bibliography: State Mineralogist Reports VI, XII–XVIII (inc.), XXI–XXIII (inc.). U. S. G. S., Water Supply Paper 338. Min. Res. 1914, 1916. 'Mineral Springs and Health Resorts of California,' by Dr. Winslow Anderson, 1890. U. S. Dept. of Agr., Bur. of Chem., Bulletin 91.

A widespread production of mineral water is shown annually in California. These figures refer to mineral water actually bottled for sale, or for local consumption. Water from some of the springs having a special medicinal value brings a price many times higher than the average shown, while in some cases the water is used merely for drinking purposes and sells for a nominal figure. Health and pleasure resorts are located at many of the springs. The waters of some of the hot springs are not suitable for drinking, but are very efficacious for bathing.

From a therapeutic standpoint, California is particularly rich in mineral springs. The counterparts of many of the world-famed spas of Europe and the eastern United States can be found here. Radioactivity has been noted in at least three localities in California: At The Geysers in Sonoma County, Arrowhead Hot Springs in San Bernardino County, and Paraiso Springs, Monterey County. It doubtless exists at others, but the State Division of Mines and Mining has not as yet had funds available to conduct the necessary investigations along this line.

So far as the efficacy of radioactivity in mineral water is concerned, it has been found by investigations of the U. S. Geological Survey and the U. S. Department of Agriculture that it is not retained and transported in bottled water. Radioactivity in water is only temporary, and dissipates. To obtain whatever therapeutic effect it may possess, radioactive water should be utilized directly at the spring.

Commercial production of mineral water in California for 1927 amounted to a total of 16,644,423 gallons, valued at $1,487,183, being a new high record in quantity and value over all previous years. The 1927 output was distributed by counties, as follows:

County	*Gallons*	*Value*
Lake	45,643	$51,149
Los Angeles	3,931,525	260,198
Napa	81,864	50,116
San Diego	109,685	51,559
Sonoma	25,428	5,889
Butte, Contra Costa, Calaveras, Fresno, Marin, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, Santa Clara, Siskiyou, Solano *	12,450,278	1,068,272
Totals	16,644,423	$1,487,183

* Combined to conceal output of a single operator in each.

The production above tabulated was in part bottled with artificial carbonation, in part natural and a large part was used in the preparation of soft drinks with flavors.

Although some of the operators complain that prohibition has all but killed off the mineral water business, the reports of actual produc-

tion of mineral water bottled and sold indicate an encouraging growth and a material increase annually both in total quantity and value, as may be noted from the tabulation below.

Mineral Water Production of California, by Years.

Mineral water was bottled for sale, at the Napa Soda Springs, Napa County, as early as 1860, and at other springs in California, notably The Geysers, Sonoma County, also at early dates; but there are no figures available earlier than the year 1887. Amounts and values, annually, since that year are shown herewith:

Year	Gallons	Value	Year	Gallons	Value
1887	618,162	$144,368	1909	2,449,834	$465,488
1888	1,112,202	252,990	1910	2,335,259	522,009
1889	808,625	252,241	1911	2,637,669	590,654
1890	258,722	89,786	1912	2,497,794	529,384
1891	334,553	139,959	1913	2,350,792	599,748
1892	331,875	162,019	1914	2,443,572	476,169
1893	383,179	90,667	1915	2,274,267	467,738
1894	402,275	184,481	1916	2,273,817	410,112
1895	701,397	291,500	1917	1,942,020	340,566
1896	808,843	337,434	1918	1,808,791	375,650
1897	1,508,192	345,863	1919	2,233,842	340,117
1898	1,429,809	213,817	1920	2,391,791	421,643
1899	1,338,537	406,691	1921	3,446,278	367,476
1900	2,456,115	268,607	1922	4,276,346	486,424
1901	1,555,328	559,057	1923	5,487,276	616,919
1902	1,701,142	612,477	1924	8,159,211	818,726
1903	2,056,340	558,201	1925	12,115,072	1,230,455
1904	2,430,320	496,946	1926	14,074,877	1,171,550
1905	2,194,150	538,700	1927	16,644,423	1,487,183
1906	1,585,690	478,186			
1907	2,924,269	544,016	Totals	121,572,371	$19,246,523
1908	2,789,715	560,507			

PHOSPHATES

Bibliography: State Mineralogist Report XXI. Bulletins 67, 91.

No commercial production of phosphates has been recorded from California, though occasional pockets of the lithium phosphate, amblygonite, Li (AlF) PO_4, have been found associated with the gem tourmaline deposits in San Diego County. Such production has been classified under lithia.

PUMICE and VOLCANIC ASH

Bibliography: State Mineralogist Reports XII, XIV, XV, XVII, XVIII, XXII. Bulletin 38 (See 'Tufa').

The production of pumice and volcanic ash for the year 1927 amounted to 13,779 tons valued at $168,896, and came from properties in Fresno, Imperial, Inyo, Kern, Mono, and San Luis Obispo counties. In 1927 an increase both in tonnage and value compared with the 1926 shipments, which were 7170 tons, worth $48,350, although the 1927 figures include also production over the past four years from a deposit for which reports had not been previously received.

The material from Imperial County and part of that from Mono is of the vesicular, block variety and was sold for abrasive purposes; the balance of the Mono material and that from Fresno, Inyo, Kern and San Luis Obispo was the volcanic ash, or tuff variety, and was employed in making soap, cleanser compounds and a large tonnage is being utilized as a concrete filler in cement displacement. The Kern County ash is going into the preparation of one of the popular and nationally advertised brands of cleanser compounds..

Pumice Production of California, by Years.

Commercial production of pumice in California was first reported to the State Mining Bureau in 1909, then not again until 1912, since which year there has been a small annual output, as indicated by the following table:

Year	Tons	Value	Year	Tons	Value
1909	50	$500	1920	1,537	$25,890
1910			1921	406	6,310
1911			1922	613	4,248
1912	100	2,500	1923	2,936	16,309
1913	3,590	4,500	1924	4,919	33,404
1914	50	1,000	1925	5,319	32,937
1915	380	6,400	1926	7,170	48,350
1916	1,246	18,092	1927	13,779	168,896
1917	525	5,295			
1918	2,114	28,669	Totals	47,122	$446,957
1919	2,388	43,657			

PYRITES

Bibliography: State Mineralogist Reports XVIII, XIX, XXII. Bulletins 38, 91. Min. and Sci. Press, Vol. 114, pp. 825, 840.

A total production of 130,910 tons of pyrite, valued at $564,823, was reported shipped in California during 1927, from properties in Alameda, Mariposa, Shasta and San Benito counties. This was an increase both in quantity and value over 100,896 tons, valued at $466,088, in 1926. The material from San Benito County was an iron sulphate (not an iron sulphide), and that from Mariposa County contains both sulphide and sulphate, but used for the same purposes as some of the pyrite and therefore classed as pyrite.

The material was mostly used in the manufacture of sulphuric acid for explosives and fertilizers, but a portion was utilized directly in the preparation of agricultural fertilizer and insecticide. The sulphur content ranged up to 46.5% S.

This does not include the large quantities of pyrite, chalcopyrite, and other sulphides which are otherwise treated for their valuable metal contents. Some sulphuric acid is annually made as a by-product in the course of roasting certain tonnages of Mother Lode auriferous concentrates while under treatment for their precious metal values.

Pyrites Production in California, by Years.

The total recorded pyrites production in California to date is as follows:

Year	Tons	Value	Year	Tons	Value
1898	6,000	$30,000	1914	79,267	$230,058
1899	5,400	28,620	1915	92,462	293,148
1900	3,612	21,133	1916	120,525	372,969
1901	4,578	18,429	1917	111,325	323,704
1902	17,525	60,306	1918	128,329	425,012
1903	24,311	94,000	1919	147,021	540,300
1904	15,043	62,992	1920	146,001	530,581
1905	15,503	63,958	1921	110,025	473,735
1906	46,689	145,895	1922	151,381	570,425
1907	82,270	251,774	1923	148,004	555,308
1908	107,081	610,335	1924	124,214	517,835
1909	457,867	1,389,802	1925	129,500	528,550
1910	42,621	179,862	1926	100,896	466,088
1911	54,225	182,954	1927	130,910	564,823
1912	69,872	203,470			
1913	79,000	218,537	Totals	2,750,490	$9,954,653

SHALE OIL

Bibliography: State Mineralogist Report XIX. U. S. Geol. Surv., Bulletins 322, 729. U. S. Bur. of Mines, Bull. 210. Eng. and Min. Jour.-Press, Vol. 118, No. 8, pp. 290–292, Aug. 23, 1924. Chem. & Met. Eng., Vol. 32, No. 6, Feb., 1925. Min. Congress Jour., Dec., 1924.

Oil Shale is defined by Gavin,[1] as follows:

"Oil shale is a compact, laminated rock of sedimentary origin, yielding over 33 per cent of ash and containing organic matter that yields oil when distilled, but not appreciably when extracted with the ordinary solvents for petroleum.

* * * * * * *

"Oil shales contain a substance, or substances, usually classed as a pyro-bitumen, that by destructive distillation, or pyrolysis, yields oils somewhat similar to petroleum. These substances have been termed 'kerogen,' from two Greek words meaning producer of wax."

The Scottish oil shales are also known as 'torbanite.'

The so-called 'oil shales' of California do not for the most part conform to the above definition, as the greater part of the oil obtained from them occurs as such and can be extracted by suitable solvents. The most extensive deposits in this state are part of the Monterey formation of Tertiary age, and physically and chemically are different from the oil shales of Scotland and from other oil shales in the United States. The mineral matter of this shale is diatomaceous; the beds that yield oil occur in massive formation; and when freshly broken smell strongly of petroleum. Most geologists consider the Monterey shales to have been the origin of the oil in some of the oil fields of California.

Although the extraction of shale oil has been a matter of commercial practice on a considerable scale for many years in Scotland, France, and Australia, it has not attained any great commercial importance as yet in the United States. Technical knowledge of the subject, however, is increasing. With the gradual depletion of the underground reserves of liquid oil, it is merely a matter of time until the development of the oil shales of the United States will be an economic necessity.

[1] Gavin, M. J., Oil Shale, An Historical, Technical, and Economic Study: U. S. Bur. of Mines, Bull. 210, p. 26, 1924.

The selling price of petroleum will be the determining factor. The recovery of by-product ammonium sulphate is an important feature of the process.

Two plants on a more or less experimental scale have been in operation in California for several years past, with commercial production beginning in a small way in 1922. The product, in part, has been sold for utilization as a flotation oil in metallurgical work, and part has been consumed as fuel at the plants. As only one plant reported output for 1927, the value is concealed under the 'unapportioned' item.

Shale Oil Production of California, by Years

Year	Barrels	Value
1922 } 1923 } *	4,333	$44,262
1924 } 1925 } *	8,688	55,240
1926 } 1927 } *	8,819	9,998
Totals	21,840	$109,500

* Annual details concealed under 'Unapportioned.'

SILICA (Sand and Quartz)

Bibliography: State Mineralogist Reports IX, XIV, XV, XVII, XVIII, XX-XXIII. Bulletins 38, 67, 91.

We combine these materials because of the overlapping roles of vein quartz which is mined for use in glass making and as an abrasive, and that of silica sand which, although mainly utilized in glass manufacture, also serves as an abrasive. Both varieties are also utilized to some extent in fire-brick manufacture.

A portion of the tonnage of vein quartz in California in 1916 and 1917 was employed in the preparation of ferro-silicon by the electric furnace. At present, some is utilized as a foundry flux, and for steel-casting molds. A portion of the silica sold (both sand and quartz) is also used in glazes for porcelain, pottery and tile, and in the body of the ware to diminish shrinkage; and some of the sand for the preparation of sodium silicate ('water glass'). Manufacturers of paint use finely ground silica, which forms as much as one-third of the total pigment in some paints. For certain purposes finely-ground crystalline material is superior in paints to other materials because of the angularity of the grains, which makes them adhere more firmly to the article painted and after wear afford a good surface for repainting. The same angularity makes artificially comminuted crystalline quartz superior to natural sand for use in wood fillers. It is also preferable for soaps and polishing powders. Part of the 1925 output was used for roofing and stucco-dash granules.

We do not include under this heading such forms of silica as: quartzite, sandstone, flint, tripoli, diatomaceous earth, nor the gem forms of 'rock crystal,' amethyst, and opal. Each of these has various industrial uses, which are treated under their own designations.

The production of silica in California in 1927 amounted to 24,636 tons, valued at $94,762, from nine properties in five counties. This was a decrease from 30,010 tons valued at $104,317 in 1926.

Of the above total 11,150 tons was of sand and 13,486 tons of vein and boulder quartz. For making the higher grades of glass, most of

the sand is imported from Belgium. Belgian sand has also displaced local material in the manufacture of sodium silicate ('water-glass'). There are various deposits of quartz in California which could be utilized for glass making, but to date they have not been so used owing to the cost of grinding and the difficulty of preventing contamination by iron while grinding.

Silica sand has been produced in the following counties of the state: Alameda, Amador, El Dorado, Los Angeles, Mono, Monterey, Orange, Placer, Riverside, San Diego, San Joaquin, and Tulare, the chief centers being Amador, Monterey and Los Angeles counties. The industry is of limited importance, so far, because of the fact that much of the available material is not of a grade which will produce first-class colorless glass; for such, it must be essentially iron-free. Even a fractional per cent of iron imparts a green color to the glass.

Total Silica Production of California.

Total silica production in California since the inception of the industry, in 1899, is shown below, being mainly sand:

Year	Tons	Value	Year	Tons	Value
1899	3,000	$3,500	1915	28,904	$34,322
1900	2,200	2,200	1916	20,880	48,908
1901	5,000	16,250	1917	19,376	41,166
1902	4,500	12,225	1918	23,257	88,930
1903	7,725	7,525	1919	18,659	101,600
1904	10,004	12,276	1920	25,324	96,793
1905	9,257	8,121	1921	10,569	49,179
1906	9,750	13,375	1922	9,874	31,016
1907	11,065	8,178	1923	7,964	30,420
1908	9,255	22,045	1924	6,808	35,006
1909	12,259	25,517	1925	12,498	96,780
1910	19,224	18,265	1926	30,010	104,317
1911	8,620	8,672	1927	24,636	94,762
1912	13,075	15,404			
1913	18,618	21,899	Totals	410,849	$1,071,339
1914	28,538	22,688			

SILLIMANITE—ANDALUSITE—CYANITE GROUP

Bibliography: State Mineralogist Report XX. Bulletins 67, 91. Dana's Mineralogy. U. S. Geol. Surv., Prof. Paper 110. Eng. & Min. Jour.-Press, Vol. 120, pp. 91–94, 1925. Amer. Mineralogist, June, 1924.

Sillimanite and andalusite are both aluminum silicates (Al_2SiO_5), having the same composition and formula, but with slightly different physical characteristics. Though both crystallize in the orthorhombic system, their crystal habits are different, andalusite being usually in coarse prismatic forms, the prisms nearly square in shape; also occurs massive, imperfectly columnar, and sometimes radiated and granular. Sillimanite commonly occurs in long, slender crystals, not distinctly terminated; prismatic faces striated and rounded; often in close parallel groups, passing into fibrous and columnar massive forms, sometimes radiating. Colors are similar. Hardness, andalusite 7.5, sillimanite 6–7. Andalusite is slightly lighter in specific gravity.

A massive deposite of andalusite, found in Dry Creek Canyon in the White Mountains of the Inyo Range, in Mono County, is being mined by the Champion Porcelain Company of Detroit, Michigan. The

material is shipped East and utilized in the manufacture of porcelain for automobile spark plugs, for other high-tension electric insulators, laboratory ware and porcelain. Porcelain made from these minerals can be subjected to sudden and extreme changes in temperature without damage.

Cyanite is also an aluminum silicate (Al_2SiO_5), of the same chemical composition as andalusite and sillimanite, but crystallizing in the triclinic system. Occurs usually in long-bladed crystals, rarely terminated; hardness 5-7.25; gravity 3.56-3.67 (being heavier than the other two); color, blue. A deposit of cyanite, apparently in quantity, is being developed in Imperial County, near Ogilby, and shipments made to a refractory plant in Los Angeles.

Dumortierite, though differing somewhat in composition from the above, being a basic aluminum silicate ($4\ Al_2O_3.3\ SiO_2$), has proved similar in behavior in ceramic work so that it is now being mixed with andalusite for electrical porcelains. A deposit of this mineral in Nevada is being mined for that purpose. Occurrences of massive dumortierite are known in Imperial County in this state and there may yet be some commercial possibilities for them.

Total Sillimanite Group Production of California, by Years.

Year	*Tons*	*Value*
1922 1923 1924 *	4,584	$98,790
1925 1926 *	4,810	203,000
1927	*	*
Totals	9,394	$301,790

* Annual details concealed under 'Unapportioned.'

SOAPSTONE and TALC

Bibliography: State Mineralogist Reports XII, XIV, XV, XVII–XXIII. Bulletins 38, 67, 91. U. S. Bur. of Mines, Bulletin 213. Rep. of Investigations, Serial No. 2253, May, 1921.

The total output of talc and soapstone in California in 1927 amounted to 16,218 tons, valued at $164,744, compared with 17,004 tons, valued at $255,645 in 1926. Nearly 80 per cent of the product was high-grade talc from Inyo, San Bernardino and Shasta counties, which material was utilized mainly in toilet powders, paint, paper, and rubber manufacture, and some in ceramics, the remaining coming from a single producer each in Butte, Calaveras and El Dorado counties.

The 'soapstone' grades were used mainly for roofing granules and as a filler in roofing paper, and part also in magnesite cement.

It is reported that California talc is steadily replacing imported talc in the toilet trade on the basis of quality. The largest production of talc in the United States comes from Vermont and New York, and of massive soapstone from Virginia.

Composition and Varieties.

Talc is hydrous magnesium silicate with the chemical formula $H_2Mg_3(SiO_3)_4$. It is also called soapstone and steatite. The term talc' properly includes all forms of the pure mineral, whereas 'steatite'

denotes particularly the massive, compact variety, and 'soapstone' the impure, massive forms containing as low as 50% of talc. When pure, talc is soft, having a hardness of 1, but impurities increase the hardness up to 3 or 4. The color varies from pure white and silvery white through gray, green, apple green, to dark green, also yellow, brown, and reddish when impure. It is commonly compact or massive, or in fine granular aggregates, and often in foliated plates or in fibrous aggregates.

Uses.

Although the uses of talc and soapstone are many and varied, some of them are not in general well known nor fully developed; and although few of their uses can justly be considered essential in the sense that no substitute can be used, there are several which are of great importance. The widest use of talc is in the powdered form, and the value depends upon color (whiteness), uniformity, fineness of grain, freedom from grit, 'slip,' and sometimes freedom from lime. The white varieties, free from grit and iron, low in lime, ground to 200-mesh and finer, are largely used as a filler for paper, rubber and paint, and the very highest grade as toilet powder. Ground talc is also used in dressing and coating cloth, in making soap, rope, twine, pipe-covering compounds, heavy lubricants, and polishes, and as a filler in concrete to make it waterproof. Ground talc and soapstone are used for foundry facings, either alone or mixed with graphite and a coarser grade is used in the manufacture of asphalt-coated roofing felts and papers, both as a filler and as a surfacing. Massive close-grained talc, free from iron and grit, is cut into blanks and baked, forming the material used for gas tips and electrical insulation, commonly known as 'lava.' Its hardness, its resistance to heat, acids and alkalies, and its great dielectric strength make it very useful for electric insulation, and no satisfactory substitute for it has been found.

Massive varieties of talc, pyrophyllite, and high grades of soapstone are cut into slate pencils and steel-workers' crayons. 'French chalk' or 'tailor's chalk' is a soft, massive talc. In China, Japan and India, massive talc (steatite) is carved into grotesque images and other forms, and is often sold as imitation jade. Soapstone is cut into slabs of 1 and 2 inches in thickness and sold as griddles, footwarmers, and fireless-cooker stones, or fabricated into laundry sinks and tubs, laboratory-table tops, hoods, tanks and sinks, electric switchboards, and for other uses in which the properties of resistance to heat, acids and alkalies, and electricity are essential.

Imports.

Foreign importations of high-grade white talc suitable for the manufacture of toilet powder have come mainly from Canada, Italy and France. Foreign producers have the benefit of cheap labor, and a low tariff import duty. In addition to these disadvantages, California operators have to contend with transcontinental freight rates to the eastern manufacturing centers. In 1927 importations totaled 25,123 short tons, valued at $545,285, compared with 24,346 tons, valued at $563,799 in 1926, according to the United States Bureau of Foreign and Domestic Commerce.

Talc Production of California, by Years.

Production was intermittent in the state up to 1912; but there has been a material growth since 1916, as shown in the following table:

Year	Tons	Value	Year	Tons	Value
1893	400	$17,750	1912	1,750	$7,350
1894			1913	1,350	6,150
1895	25	375	1914	1,000	4,500
1896			1915	1,663	14,750
1897			1916	1,703	9,831
1898			1917	5,267	45,279
1899			1918	11,760	85,534
1900			1919	8,764	115,091
1901	10	119	1920	11,327	221,362
1902	14	288	1921	8,752	130,078
1903	219	10,124	1922	13,378	197,186
1904	228	2,315	1923	17,439	252,661
1905	300	3,000	1924	16,179	242,770
1906			1925	15,465	239,084
1907			1926	17,004	255,645
1908	3	48	1927	16,218	164,744
1909	33	280			
1910	740	7,260	Totals	150,991	$2,033,574
1911					

STRONTIUM

Bibliography: Bulletins 67, 91. U. S. G. S., Bull. 540; 660–I.

There has been no production of strontium minerals in California since 1918, though in that year both celestite ($SrSO_4$), and the carbonate, strontianite ($SrCO_3$) were shipped. The first recorded commercial output of strontium minerals in California was in 1916. The occurrence of the carbonate is particularly interesting and valuable, as it appears to be the only considerable deposit of commercial importance so far opened up in the United States. Shipments reported as averaging 80% $SrCO_3$ have been made. The deposit is associated with deposits of barite, near Barstow, San Bernardino County. The carbonate has also been found in massive form near Shoshone, Inyo County. In addition to Imperial County, celestite is found near Calico and Ludlow, and in the Avawatz Mountains in San Bernardino County, but as yet undeveloped.

Production of strontium minerals in California, by years, has been as follows:

Year	Tons	Value
1916	57	$2,850
1917	3,050	37,000
1918	2,900	33,000
1919		
Totals	6,007	$72,850

The principal use for strontium in the United States is in the form of the nitrate in the manufacture of red flares, or Costen and Bengal lights and fireworks. It is imported mainly from Germany and England. In Germany and Russia, strontium in the form of the hydroxide is used in the manufacture of beet sugar. It is stated that strontia is more efficient and satisfactory in that process than lime, as it gives an additional recovery of 6% to 8%.

Of the two minerals, strontianite (carbonate) and celestite (sulphate), the carbonate is the more desirable as it is easier to convert to other salts; but it is scarcer. Celestite is found with limestone and sandstone and is sometimes associated with gypsum. Strontianite is also found with limestone, but associated with barite and calcite.

SULPHUR

Bibliography: State Mineralogist Reports IV, XIII, XIV. Bulletins 38, 67, 91.

In 1923–1924 there was a small production of sulphur, from a single property in Kern County. It was ground, and utilized as a fertilizer and in dusting for mildew. This was the first commercial output of native sulphur in California for many years although this mineral has been found to some extent in Colusa, Imperial, Inyo, Kern, Lake, Sonoma, Tehama, and Ventura counties.

Sulphur was produced at the famous Sulphur Bank mine in Lake County, during the years 1865–1868 (inc.), totaling 941 tons, valued at $53,500; following which the property became more valuable for its quicksilver. The Elgin quicksilver mine, near Wilbur Springs, Colusa County, is a similar occurrence.

The principal sources in the United States are the stratified deposits in Louisiana and Texas, extraction being accomplished by a unique system of wells with steam pipes. It is stated that three large companies operating there are capable of producing more than 1,000,000 tons annually in excess of our normal consumption in the United States, which averages about 600,000 tons. The mines at Freeport, Texas, are in a peculiarly favorable location in that they are practically at tidewater.

Formerly considerable sulphur was imported from Italy and from Japan; but the situation is now reversed, so that in 1927, a total of 789,371 long tons, valued at $16,269,254, was exported from the United States, principally to Europe and Canada, also Australia, New Zealand, Mexico and South America.

CHAPTER SIX

SALINES

Bibliography: State Mineralogist Reports III, XIV, XV, XVII–XXIII (inc.). Bulletin 24. Spurr and Wormser, "Marketing of Minerals." "Non-Metallic Minerals," by R. B. Ladoo. See also under each substance.

Under this heading are included borax, common salt, soda, potash, and other alkaline salts. The first two have been produced in a number of localities in California, more or less regularly since the early sixties. Except for a single year's absence, soda has had a continuous production since 1894. Potash, magnesium chloride and sulphate, and calcium chloride have been added to the commercial list in recent years, and in 1926 joined by bromine. The nitrates are still prospective.

Our main resources of salines are the lake beds of the desert regions of Imperial, Inyo, Kern, Los Angeles, San Bernardino, and San Luis Obispo counties, and the waters of the Pacific Ocean.

The total value of this group shows an increase to $7,350,892 in 1927 over the 1926 figure of $5,458,593 as detailed in the following tabulation:

Substance	1926		1927		Increase+ Decrease— Value
	Tons	Value	Tons	Value	
Borates	47,605	$1,625,298	72,462	$3,043,260	$1,417,962+
Magnesium salts	4,881	124,470	*		
Potash	32,884	812,285	67,340	1,952,852	1,140,567+
Salt	311,761	1,124,978	263,028	639,127	485,851—
Soda	63,333	1,305,802	62,571	1,478,237	172,435+
Unapportioned		[a]465,760		[b]237,416	228,344—
Total value		$5,458,593		$7,350,892	
Net increase					$1,892,299+

* Under 'unapportioned.'
[a] Includes bromine and calcium chloride.
[b] Includes bromine, calcium chloride, and magnesium salts.

BORATES

Bibliography: State Mineralogist Reports III, X, XII–XV (inc.), XVII–XXIII (inc.). Bulletins 24, 67, 91.

During 1927 there was produced in California a total of 89,093 tons of borate materials compared with 84,101 tons for the year 1926. The material shipped during the year included crude and select colemanite ore from Inyo County, the new sodium borates, kernite (Rasorite) and kramerite from Kern County; also crystallized borax prepared by evaporation of brines at Searles Lake in San Bernardino County.

As the crude ore is not sold as such, but is almost entirely calcined before shipping to the refinery for conversion into the borax of commerce, and because of the fact that the material varied widely in boric acid content, we have recalculated the tonnage to a basis of 40% A.B.A. This is approximately the average A.B.A. content of the colemanite material after calcining, and also of the crystallized borax obtained from evaporation of the lake brines.

Recalculated as above, the 1927 production totals 72,462 tons, valued at $3,043,260, an increase over the similar figures for 1926, which were 47,605 tons and $1,625,298.

Colemanite is a calcium borate, and the material mined is shipped to seaboard chemical plants for refining. The latest development in the borax industry is the finding in quantity and opening up of a new borate mineral which bids fair to supplant colemanite in much the same way that the colemanite deposits displaced the borax industry in the desert playas or dry lakes, some forty years ago. This new mineral is 'kernite' (or 'rasorite'), a sodium borate with a smaller water-of-crystallization content than the 'borax' of commerce, so that when re-crystallized to borax, the resulting product has an increased weight over the original material. These deposits are being opened up by the Pacific Coast Borax Company in southeastern Kern County.

Refined 'borax' (sodium tetraborate) is used in making the enameled coating for cast-iron and steelware employed in plumbing fixtures, chemical equipment, and kitchen utensils. It is also a constituent of borosilicate glasses which are utilized in making lamp chimneys, baking dishes, and laboratory glassware. Other important uses of borax are in the manufacture of laundry and kitchen soaps, in starch, paper sizing, tanning, welding, and in the preparation of boric acid, which is employed as an antiseptic and in preserving meats. Among the newer uses for borax is its employment in the preserving of citrus fruits by washing them in a solution of borax, which closes the pores of the skin. The application of this process is increasing in California and Florida. Another is as a preservative of wood, in addition to which borax, being non-inflammable, renders it fireproof.

An increased foreign demand stimulated an increased production of this material. The total amount exported from the United States was 36,954 short tons valued at $2,422,144 compared with 14,305 short tons valued at $1,256,798 in 1926. From one California port in 1927 approximately 22,000 short tons of borax was shipped to the United Kingdom and continental Europe.

California deposits are the most important source of borax in the world, and that this material can be mined and refined at a low cost, supplying an increasing market, is shown in the following article taken from the ENGINEERING AND MINING JOURNAL:[1]

"New aspects in the present situation of the borax industry have been disclosed by an authority as the result of the recent development of important new deposits of borate minerals in the Kramer district in southeast Kern County, California.

"The new mine that has been opened by the Pacific Coast Borax Company in the northwest corner of Sec. 24, T. 11 N., R. 8 W., and the extreme northwest corner of Sec. 19 of the township next adjoining on the east, is apparently now on regular production, with railroad connections established and shipping the new kernite ore in large quantities. The present output of borate ores or products in the United States is approximately as follows:

	Average daily shipment
Pacific Coast Borax Co. mine near Kramer, Cal.	200 tons crude kernite ore of high purity
American Trona Corp., Searles Lake, Cal.	140 tons refined borax
West End Chemical Co. mine near Las Vegas, Nev.	25 tons calcined colemanite
West End Chemical Co. plant at Searles Lake, Cal.	15 tons refined borax
Total daily production	380 tons

"The total production represented by these averages, if they are maintained throughout this year, will be approximately 140,000 tons of borax for 1928, which is probably approximately the amount of present market requirements.

"The new source of borate mineral at Kramer is probably the most available source of borax that the world has ever known, in quality of material, massiveness, purity, minability of the deposit, and accessibility. The new mineral kernite apparently exists under extremely favorable mining conditions, so that the ore can apparently be brought to the surface at a cost of less than $10 a ton. It may be recalled that the kernite ore recovered in such pure form as indicated by the present operations should yield more than its equivalent in weight of commercial borax, and that

[1] Engineering and Mining Journal, Mar. 31, 1928, p. 551.

only the simplest refining processes are required to transform the crude material as mined into the commercial product. Therefore it is entirely likely that the cost of borax may be cut from recent quotations, which have ranged around four cents a pound, to one-half that amount or even less.

"Another interesting factor may also have an important influence in the production situation and marketing of this product. It appears that an important extension of the richest part of these deposits lies south of the property now being operated, and this new deposit is evidently under independent control. The discovery was made by borings and is situated about three-quarters of a mile southwest of the original shaft in the northeast corner of Sec. 24. According to authentic information, these borax deposits revealed a thick section of particularly pure kernite in the new area referred to, and a mining shaft is being rapidly sunk to develop this new deposit. The material which may be developed from this independent operation promises to exert an important influence with the Kramer district."

Total Production of Borate Materials in California.

Borax was first discovered in California in the waters of Tuscan Springs in Tehama County, January 8, 1856. Borax Lake in Lake County was discovered in September of the same year by Dr. John A. Veach. This deposit was worked in 1864–1868, inclusive, and during that time produced 1,181,365 pounds of refined borax. The bulk of it was exported by sea, to New York. This was the first commercial output of this salt in the United States, and California is still today the leading American producer of borax, having been for many years the sole producer.

Production from the dry lake 'playa' deposits of Inyo and San Bernardino counties began in 1873; but it was not until 1887 that the borax industry was revolutionized by the discovery of the colemanite beds at Calico, in San Bernardino County, and later similar beds in Inyo and Los Angeles counties. The colemanite deposits of Ventura County are at present unworked, owing to lack of transportation facilities. Some production of colemanite has been made from deposits opened up in Clarke County, Nevada.

The total production of borate materials in California is shown in the following table:

Year	Tons	Value	Year	Tons	Value
1864	12	$9,478	1897	8,000	$1,080,000
1865	126	94,099	1898	8,300	1,153,000
1866	201	132,538	1899	20,357	1,139,882
1867	220	156,137	1900	25,837	1,013,251
1868	32	22,384	1901	22,221	982,380
1869	----------	----------	1902	[a]17,202	2,234,994
1870	----------	----------	1903	34,430	661,400
1871	----------	----------	1904	45,647	698,810
1872	140	89,600	1905	46,334	1,019,158
1873	515	255,440	1906	58,173	1,182,410
1874	915	259,427	1907	53,413	1,200,913
1875	1,168	289,080	1908	22,200	1,117,000
1876	1,437	312,537	1909	16,628	1,163,960
1877	993	193,705	1910	16,828	1,177,960
1878	373	66,257	1911	50,945	1,456,672
1879	364	65,443	1912	42,135	1,122,713
1880	609	149,245	1913	58,051	1,491,530
1881	690	189,750	1914	62,500	1,483,500
1882	732	201,300	1915	67,004	1,663,521
1883	900	265,500	1916	103,523	2,409,375
1884	1,019	198,705	1917	109,944	2,561,958
1885	942	155,430	1918	88,772	1,867,908
1886	1,285	173,475	1919	66,791	1,717,192
1887	1,015	116,689	1920	127,065	2,794,206
1888	1,405	196,636	1921	50,136	1,096,326
1889	965	145,473	1922	[b]39,087	1,068,025
1890	3,201	480,152	1923	62,667	1,893,798
1891	4,267	640,000	1924	52,070	1,599,149
1892	5,525	838,787	1925	46,124	1,526,938
1893	3,955	593,292	1926	47,605	1,625,298
1894	5,770	807,807	1927	72,462	3,043,260
1895	5,959	595,900			
1896	6,754	675,400	Totals	1,593,940	$54,616,153

[a] Refined borax. [b] Recalculated to 40% 'anhydrous boric acid' equivalent beginning with 1922.

BROMINE

The first commercial production of bromine and bromine compounds was begun during 1926 by the California Chemical Corporation in its plant at Chula Vista, San Diego County, from salt-works bittern waters. This same plant has been recovering magnesium chloride for a number of years. A small amount of bromine was also reported made at the similar bittern-water plant of the Industrial Chemical Company at Newark, Alameda County. The amounts and values of this first and second years' yields of bromine in California are concealed under the 'Unapportioned' item.

A large part of the bromine output of the United States is not sold as bromine, but in the form of potassium and sodium bromides and other salts. The principal production in the United States has come from bitterns from salt wells in Michigan, Ohio and West Virginia.

The best known uses of bromine are its application in the form of silver bromide in photography and the manufacture of ethyl gasoline. Bromine, as such, was used extensively in the European War in making asphyxiating gases. It also has some uses in medicine, particularly in the treatment of nervous diseases.

CALCIUM CHLORIDE

Bibliography: U. S. Geol. Surv., Min. Res. 1919, Pt. II. Engineering and Contracting, Roads & Streets monthly issue, Feb. 6, 1924. 'How to Maintain Roads,' manual of instruction of Dow Chemical Company.

Calcium chloride is hygroscopic, that is, it has an affinity for water. This property is taken advantage of by utilizing this salt as a drying agent. It is also sprinkled on dirt roads and playgrounds to keep down dust by absorbing moisture. In refrigerating machinery for ice factories, meat-packing houses and cold-storage warehouses, a calcium-chloride solution is stated to have some advantages over salt brine. In fire buckets this solution has an advantage over pure water, in that it has a lower freezing point, does not corrode metal, and tends to keep the buckets full due to its absorbing moisture from the atmosphere. Powdered calcium chloride is used in drying gases, fruits and vegetables.

Total Calcium Chloride Production of California.

Commercial production of calcium chloride in California was first reported to the State Mining Bureau in 1921, from two plants in San Bernardino County, being obtained as a by-product in the refining of salt from deposits in certain of the desert dry lakes. In 1922–1924, there was only a single operator, so that the annual details are concealed under the 'unapportioned' item.

Year	*Tons*	*Value*
1921	683	$22,980
1922 } 1923 } *	1,204	26,580
1924 } 1925 } *	10,988	328,876
1926 } 1927 } *	34,195	508,748
Totals	47,070	$887,184

* Annual details concealed under 'Unapportioned.'

MAGNESIUM SALTS

Bibliography: State Mineralogist Reports XX, XXI. Bulletin 91. 'Dictionary of Applied Chemistry,' by Thorpe. U. S. Geol. Surv., Min. Res. of U. S.

The 1927 production of magnesium salts in California is concealed under 'unapportioned.' This was nearly all chloride, sold for use in magnesite stucco and cement mixtures (Sorel cement), also some for 'road liquor.' It was in part marketed in the liquid form testing 34°–36° Baumé, and in part as dry crystals, and was prepared from residual bitterns at salt plants in Alameda and San Diego counties. The sulphate marketed was utilized for medicinal and bath purposes.

With the use of magnesite cement and stucco coming more into prominence in building construction on the Pacific Coast, the demand for magnesium chloride is increasing here; but the domestic article has to meet the competition of the cheaper, imported German chloride.

The average value reported for the chloride produced in California in 1927 was approximately $19 per ton, f. o. b. plant.

Total Production of Magnesium Salts in California.

Commercial production of magnesium chloride in California was begun in 1916 by some of the salt companies, from the residual bitterns obtained during the evaporation of sea water for its sodium chloride. In addition, some magnesium sulphate, or 'epsom salts' is also made, annually, but in smaller amount.

The total production of magnesium salts in California, since the beginning of the industry here, is shown in the following tabulation:

Year	*Tons*	*Value*
1916	851	$6,407
1917	1,064	34,973
1918	1,008	29,955
1919	1,616	82,457
1920	3,150	107,787
1921	4,153	106,140
1922	3,036	89,788
1923	3,662	116,031
1924	4,823	145,883
1925	4,221	132,553
1926	4,881	124,470
1927	*	------
Totals	32,465	$976,444

* Concealed under 'Unapportioned.'

NITRATES

Bibliography: State Mineralogist Report XV. Bulletins 24, 67, 91. U. S. G. S., Press Bulletin No. 373, July, 1918. Smithsonian Inst., Publ. No. 2421, 1916.

Nitrates of sodium, potassium and calcium have been found in various places in the desert regions of the state, but no deposit of commercial value has been developed as yet. It is hoped that a closer search may some day be rewarded by workable discoveries. At present the principal commercial source of nitrates is the Chilean saltpeter (sodium nitrate) deposits in South America.

The fixation of atmospheric nitrogen electrically has been accomplished successfully in Germany and Scandinavia. The possibilities of cheap hydro-electric power in California make the subject one of

interest to us, as we have also the natural raw materials and chemicals to go with the power. Sodium and potassium cyanides can be made by fixation of atmospheric nitrogen electrically.

POTASH

Bibliography: State Mineralogist Reports XV, XVIII, XX, XXII. Bulletins 24, 67, 91. U. S. G. S., Min. Res. 1913, 1914, 1915. Senate Doc. No. 190, 62d Congress, 2d Session. Mining & Sci. Press, Vol. 112, p. 155; Vol. 114, p. 789. Eng. & Min. Jour.-Press, Vol. 117, p. 557, Apr. 5, 1924.

During 1927, a total of 67,340 tons of potash salts of all grades was produced in California, valued at $1,952,852, compared with 32,884 tons and $812,285 in 1926. This was in part chloride and part from distillery slops char. The quality of the product averaged 60% equivalent K_2O content; and the material was sold principally for fertilizer manufacture.

Imports of crude potash minerals and salts into the United States in 1927, according to the U. S. Bureau of Foreign and Domestic Commerce, amounted to 623,109 long tons, valued at $13,423,925, compared with 815,715 tons and $14,122,699 in 1926. These materials consisted mainly of 'manure salts,' crude chloride (muriate) and sulphate, and kainite, all of which are admitted duty-free.

Quotations have recently ranged from $46 per ton c.i.f. Atlantic and Gulf ports, for high-grade sulphate (90%–95%), to $35 per ton for muriate (80%–85%), and $19 for manure salts (30%).

Other uses for potash salts, besides those noted above, are in the manufacture of the best liquid soap and some higher-grade cake soaps, of some finer grades of glass, and in matches. The chemical requirements include tanning, dyeing, metallurgy, electroplating, photography and medicine.

Total Production of Potash in California.

Potash production began commercially in California in 1914, with a small yield from kelp. The bulk of the output comes from deposits of potash-bearing residues and brines in the old lake beds of the desert regions, particularly Searles Lake, San Bernardino County. A small amount is made annually from salt-works bitterns, and for a time there was some from Portland cement dust. Some also is obtained from molasses distillery-slops char.

The annual amounts and value of these potash materials, since their beginning in California in 1914, are shown by the following table:

Year	*Tons*	*Value*
1914	10	$460
1915	1,076	19,391
1916	17,908	663,605
1917	129,022	4,202,889
1918	49,381	6,808,976
1919	28,118	2,415,963
1920	26,298	1,465,463
1921	14,806	390,210
1922	17,776	584,388
1923	29,597	709,836
1924	33,107	747,407
1925	36,355	829,770
1926	32,884	812,285
1927	67,340	1,952,852
Totals	483,678	$21,609,495

SALT

Bibliography: State Mineralogist Reports II, XII–XV (inc.), XVII–XXIII (inc.); Bulletins 24, 67, 91. U. S. Geol. Surv., Bull. 669. U. S. Bur. of Mines, Bull. 146.

Most of the salt production in California is obtained by evaporating the water of the Pacific Ocean, plants being located on the shores of San Francisco, Monterey, and San Diego bays, and at Long Beach. Additional amounts are derived from lakes and lake beds in the desert regions, mainly in Kern and San Bernardino counties. A small amount of valuable medicinal salts is obtained by evaporation of the water of Lake Mono, Mono County.

Distribution of the 1927 salt production of California, by counties, was as follows:

County	*Tons*	*Value*
Alameda	180,623	$366,346
Kern	14,960	69,839
Los Angeles, Modoc, Mono,[a] Monterey, San Bernardino, San Diego, San Mateo*	67,445	202,942
Totals	263,028	$639,127

* Combined to conceal output of a single operator in each.
[a] Medicinal salts.

The above returns show a decrease both in tonnage and value from the figures of 1926, which were 311,761 tons and $1,124,978. There were eight plants operating in Alameda County in 1927, and a total of nine in the other counties tabulated:

Production of Salt in California, by Years.

Amount and value of annual production of salt in California from 1887 is shown in the following tabulation:

Year	Tons	Value	Year	Tons	Value
1887	28,000	$112,000	1909	155,680	$414,708
1888	30,800	92,400	1910	174,920	395,417
1889	21,000	63,000	1911	173,332	324,255
1890	8,729	57,085	1912	185,721	383,370
1891	20,094	90,303	1913	204,407	462,681
1892	23,570	104,788	1914	223,806	583,553
1893	50,500	213,000	1915	169,028	368,737
1894	49,131	140,087	1916	186,148	455,695
1895	53,031	150,576	1917	227,825	584,373
1896	64,743	153,244	1918	212,076	806,328
1897	67,851	157,520	1919	233,994	896,963
1898	93,421	170,855	1920	230,638	972,648
1899	82,654	149,588	1921	197,989	832,702
1900	89,338	204,754	1922	223,238	819,187
1901	126,218	366,376	1923	275,979	1,130,670
1902	115,208	205,876	1924	318,800	1,159,137
1903	102,895	211,365	1925	284,068	949,826
1904	95,968	187,300	1926	311,761	1,124,978
1905	77,118	141,925	1927	263,028	639,127
1906	101,650	213,228			
1907	88,063	310,967	Totals	5,764,184	$17,082,061
1908	121,764	281,469			

SODA

Bibliography: State Mineralogist Reports XII, XIII, XV, XVII, XVIII, XX; Bulletins 24, 67, 91. U. S. Geol. Surv., Bull. 717.

The production of sodium salts in California in 1926 included: soda ash, caustic soda and bicarbonate from plants at Owens Lake, Inyo

county and trona ('sesqui-carbonate,' a double salt of Na_2CO_3 and $NaHCO_3$) from Searles Lake, San Bernardino County. There were no shipments of salt cake (sulphate) from the Carrizo Plains, San Luis Obispo County in 1927. The total amounted to 62,571 tons, valued at $1,478,239, being a slight decrease in quantity but an increase in value compared with the 1926 figures of 63,333 tons and $1,305,802.

The dense ash and bicarbonate were used mainly in the manufacture of soap, glass, sugar refining, and chemicals; and the trona for metallurgical purposes.

Sodium compounds to some extent replace potassium compounds, in glass and soap making, in photography, in match making, in tanning, sugar refining, and in the manufacture of cyanide for extracting gold and silver from their ores.

Soda Production of California, by Years.

The total output, showing amount and value of these materials in California since the inception of the statistical records of the State Mining Bureau, is given in the table which follows:

Year	Tons	Value	Year	Tons	Value
1894	1,530	$20,000	1912	7,200	$37,094
1895	1,900	47,500	1913	1,861	24,936
1896	3,000	65,000	1914	6,522	115,396
1897	5,000	110,000	1915	5,799	83,485
1898	7,000	154,000	1916	10,593	264,825
1899	10,000	250,000	1917	24,505	928,578
1900	1,000	50,000	1918	20,447	855,423
1901	8,000	400,000	1919	21,294	721,958
1902	7,000	50,000	1920	32,407	1,164,898
1903	18,000	27,000	1921	14,828	438,996
1904	12,000	18,000	1922	20,084	573,661
1905	15,000	22,500	1923	34,885	764,284
1906	12,000	18,000	1924	32,536	711,796
1907	----------	----------	1925	48,625	947,649
1908	9,600	14,400	1926	63,333	1,305,802
1909	7,712	11,593	1927	62,571	1,478,239
1910	8,125	11,862			
1911	9,023	52,887	Totals	543,380	$11,739,762

CHAPTER SEVEN

BY COUNTIES

Introductory.

The State of California includes a total area of 158,297 square miles, of which 155,652 square miles are of land. The maximum width is 235 miles, the minimum 148 miles, and the length from the northwest corner to the southeast corner is 775 miles. The state is divided into fifty-eight counties. The 1920 census figures show a total population for California of 3,437,709. A 1927 estimate by the State Controller places the figure that year at 5,398,457. Minerals of commercial value exist in every county, and during 1927 some active production was reported to the State Division of Mines and Mining from all of the fifty-eight.

Rank of Counties in Mineral Yield, 1927.

Of the first ten counties, in point of total output for 1927, the first four, Los Angeles, Kern, Orange, Ventura, owe their position mainly to petroleum, as does also Fresno (sixth). Los Angeles, due to its oil, leads all the others, being credited with 36% of the entire state's total value for 1927, having passed Kern in 1923, which led for many years. San Bernardino (fifth) owes its place chiefly to cement, silver, potash, borax, mineral water, and tungsten; Riverside (seventh) to cement, stone, brick and tile; Yuba (eighth) to gold; Santa Cruz (ninth) to cement; Plumas (tenth) to copper. Twenty-four counties have each a total in excess of a million dollars in 1927. Cement is an important item in nine of these counties, gold in four, and miscellaneous stone, granite, and soda in one each. In the point of variety and diversity, San Bernardino County led all others in 1927, with a total of 23 different mineral products on its commercial list, followed by Los Angeles with 20; San Diego with 19; Kern and Riverside with 17 each; Inyo with 13; Butte, 12; Calaveras, Monterey, Santa Barbara and Shasta with 11 each. The counties with their mineral resources, production for 1927, etc., are considered in detail in the following paragraphs.

County	*Value*	*County*	*Value*
1. Los Angeles	$131,832,441	31. Mariposa	$499,878
2. Kern	64,729,488	32. Tulare	474,173
3. Orange	60,547,041	33. Tuolumne	432,416
4. Ventura	30,995,379	34. Napa	417,229
5. San Bernardino	16,140,703	35. Stanislaus	393,089
6. Fresno	7,547,216	36. Merced	366,873
7. Riverside	6,543,369	37. Placer	360,224
8. Yuba	3,679,632	38. Monterey	351,049
9. Santa Cruz	3,473,209	39. Imperial	350,977
10. Plumas	3,260,723	40. Butte	308,139
11. Santa Barbara	2,699,296	41. Siskiyou	298,946
12. Alameda	2,577,787	42. San Luis Obispo	295,030
13. Inyo	2,519,834	43. Sonoma	265,392
14. Sacramento	2,348,916	44. El Dorado	245,435
15. Nevada	2,213,709	45. Mono	102,187
16. Amador	2,207,798	46. Lake	85,048
17. Contra Costa	2,172,756	47. Glenn	63,869
18. Shasta	1,950,088	48. San Francisco	62,700
19. San Benito	1,901,854	49. Modoc	62,251
20. San Mateo	1,863,838	50. Del Norte	53,975
21. San Diego	1,619,431	51. Lassen	49,425
22. Calaveras	1,608,714	52. Mendocino	47,670
23. Solano	1,557,840	53. Yolo	17,895
24. Madera	1,059,666	54. Colusa	13,207
25. Santa Clara	990,876	55. Tehama	5,350
26. Sierra	752,533	56. Alpine	5,306
27. San Joaquin	711,965	57. Kings	1,599
28. Humboldt	562,802	58. Sutter	300
29. Trinity	555,854		
30. Marin	527,004	Total	$366,781,394

ALAMEDA

Land area: 732 square miles.
Population: 344,177 (1920 census).
Location: East side of San Francisco Bay.

Alameda County, while in no sense one of the 'mining counties,' comes twelfth on the list with a value of mineral products for 1927 of $2,577,787, a decrease from the 1926 total, which was $3,158,474.

The mineral resources of this county include asbestos, brick, chromite, clay, coal, copper, gold, limestone, quartz crystals, glass-sand, sandstone, silver, soapstone, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and hollow building tile	------	$587,402
Clay (pottery)	6,593 tons	20,516
Salt	180,623 tons	366,346
Stone, miscellaneous	------	1,538,017
Other minerals *	------	65,506
Total value		$2,577,787

* Includes magnesium salts, potash, pyrites.

ALPINE

Land area: 776 square miles.
Population: 243 (1920 census).
Location: On eastern border of state, south of Lake Tahoe.

This county lies just south of Lake Tahoe, in the high Sierra Nevada. Transportation is by auto, wagon, or mule back, and facilities in general are lacking to promote development work.

The mineral resources of this section are varied and the country has not yet been thoroughly prospected. Occurrences of barium, copper, gold, gypsum, lead, limestone, pyrite, rose quartz, silver, tourmaline, and zinc have been noted here.

Commercial production for 1927 was as follows, being an increase from $450 in 1926:

Substance	*Amount*	*Value*
Gold	---	$146
Silver	105 fine oz.	60
Stone, miscellaneous	---	5,100
Total value		$5,306

AMADOR

Land area: 601 square miles.
Population: 7793 (1920 census).
Location: East-central part of state—Mother Lode District.

The value of Amador County's mineral production decreased from $2,451,500 in 1926 to $2,207,798, placing it number sixteen on the list of counties in the state as regards total value of mineral substances marketed. The decrease was due mainly to gold.

Although having an output consisting of nine different minerals, the leading product, gold, makes up approximately 87% of the total value for the year.

Amador at one time led the state in gold production, though exceeded in 1920–1923 and in 1926–1927 by Yuba and Nevada counties, but in 1925 by Yuba County only.

Commercial output for 1927 was as follows:

Substance	*Amount*	*Value*
Clay (pottery)	118,636 tons	$165,210
Gold	------	1,922,714
Lead	2,491 lbs.	157
Silver	19,963 fine oz.	11,319
Stone, miscellaneous	------	10,400
Other minerals *	------	97,998
Total value		$2,207,798

* Includes brick, coal, copper, silica.

BUTTE

Land area: 1722 square miles.
Population: 30,030 (1920 census).
Location: North-central portion of state.

Butte, fortieth county in California in regard to the value of its mineral output, reported a commercial production of twelve mineral substances, having a total value of $308,139, as compared with $461,945 in 1926. As will be noted in the following tabulation, gold is the most important item. Butte stands tenth among the gold-producing counties of the state. Among the mineral resources of this section are asbestos, barytes, chromite, gems, gold, limestone, marble, mineral water, platinum group, silver and miscellaneous stone.

Commercial value for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and clay	---	$17,800
Gems	---	275
Gold	---	143,494
Platinum	7 fine oz.	499
Silver	655 fine oz.	371
Stone, miscellaneous	---	130.603
Other minerals *	---	15,097
Total value		$308,139

* Includes copper, lead, mineral water, natural gas, soapstone.

CALAVERAS

Land area: 1027 square miles.
Population: 6183 (1920 census).
Location: East-central portion of state—Mother Lode district.

Calaveras County reported production of eleven different minerals, valued at $1,608,714, during the year 1927, as compared with the 1926 output of $1,809,772. Cement, gold, copper and stone are the chief mineral substances. In regard to total value of mineral output, Calaveras stands twenty-second among the counties of the state for 1927, and eighth in gold.

The principal mineral resources developed and undeveloped are: Asbestos, chromite, clay, copper, fuller's earth, gold, limestone, marble, mineral paint, mineral water, platinum group, pyrite, quartz crystals, silver, soapstone, and miscellaneous stone.

Commercial output for 1927 was as follows:

Substance	*Amount*	*Value*
Chromite	225 tons	$5,063
Copper	750,909 lbs.	98,367
Gold	----	219,217
Lead	4,606 lbs.	290
Silver	7,023 fine oz.	3,982
Other minerals *	----	1,281,795
Total value		$1,608,714

* Includes cement, pottery clay, gems (quartz crystals), mineral water, soapstone, miscellaneous stone.

COLUSA

Land area: 1140 square miles.
Population: 9920 (1920 census).
Location: Sacramento Valley.

Colusa County lies largely in the basin of the Sacramento Valley. Its western border, however, rises into the foothills of the Coast Range of mountains, and its mineral resources—largely undeveloped—include coal, chromite, copper, gypsum, manganese, mineral water, pyrite, quicksilver, sandstone, miscellaneous stone, sulphur, and in some places traces of gold and silver.

The value of the 1927 production was $13,207, a decrease from the 1926 figures of $91,194, giving it fifty-fourth place, and was as follows:

Substance	*Value*
Stone, miscellaneous	$13,200
Unapportioned	7
Total value	$13,207

CONTRA COSTA

Land area: 714 square miles.
Population: 53,889 (1920 census).
Location: East side of San Francisco Bay.

Contra Costa, like Alameda County, lies on the eastern shore of San Francisco Bay, and is not commonly considered among the mineral producing counties of the state. It stands seventeenth on the list in this respect, however, with an output valued at $2,172,756 for the calendar year 1927. Various structural materials make up the chief items, including brick, cement, limestone, and miscellaneous stone. Among the others are asbestos, clay, coal, gypsum, manganese, mineral water, and soapstone.

Commercial production for 1927 was as follows:

Substance	*Value*
Brick and hollow building tile	$303,302
Stone, miscellaneous	816,140
Other minerals *	1,053,314
Total value	$2,172,756

* Includes cement, clay (pottery), limestone, mineral water.

DEL NORTE

Land area: 1024 square miles.
Population: 2759 (1920 census).
Location: Extreme northwest corner of state.
Transportation: Motor, wagon and mule back; steamer from Crescent City.

Del Norte almost rivals Alpine County in regard to inaccessibility. Like the latter county also, given transportation and kindred facilities, this portion of the state presents a field for development along mining lines especially. Its chief mineral resources, largely untouched, are chromite, copper, gems, gold, iron, platinum group, silver, and miscellaneous stone.

The 1927 output was a decrease from the figure of $70,464 in 1926,

the principal item of which is crushed rock used on highway construction, and rock used on the Crescent City harbor jetty.

Commercial production for 1927, giving it fiftieth place, was as follows:

Substance	*Amount*	*Value*
Gold		$384
Silver	2 fine oz.	1
Stone, miscellaneous		53,350
Other minerals		240
Total value		$53,975

EL DORADO

Land area: 1753 square miles.
Population: 6426 (1920 census).
Location: East-central portion of the state, northernmost of the Mother Lode counties.

El Dorado County, which contains the locality where gold in California was first heralded to the world, comes forty-fourth on the list of counties ranked according to the value of their total mineral production during the year 1927. In addition to the segregated figures here given, a large tonnage of limestone is annually shipped from El Dorado for use in cement manufacture, and whose value is included in the state total for cement. The decrease from the 1926 figure of $302,086 was due to limestone.

The mineral resources of this section, many of them undeveloped, include asbestos, barytes, chromite, clay, copper, gems, gold, iron, molybdenum, limestone, quartz crystals, quicksilver, slate, soapstone, silver, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	-----	$82,254
Limestone	96,733 tons	146,506
Silver	767 fine oz.	383
Stone, miscellaneous	-----	500
Other minerals *	-----	15,792
Total value		$245,435

* Includes copper, gems, silica, slate, soapstone.

FRESNO

Land area: 5950 square miles.
Population: 128,779 (1920 census).
Location: South-central portion of state.

Fresno County, sixth in importance as a mineral producer among the counties of California, reported an output for 1927 of nine mineral substances with a total value of $7,547,216, an increase from the reported 1926 production, which was worth $6,699,928.

The bulk of the above is derived from the petroleum production of the Coalinga field, with miscellaneous stone also important.

The mineral resources of this county are many, and, aside from crude oil, are in the main not fully developed. They include asbestos, barytes, brick, chromite, copper, gems, gold, graphite, gypsum, magnesite, natural gas, petroleum, quicksilver, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Brick and hollow building tile	-----		$89,145
Gold	-----		17,406
Granite	17,186	cu. ft.	74,424
Natural gas	1,682,652	M cu.ft.	148,227
Petroleum	7,202,284	bbls.	5,977,176
Silver	136	fine oz.	77
Stone, miscellaneous	-----		1,118,761
Other minerals	-----		122,000
Total value			$7,547,216

* Includes mineral water, pumice.

GLENN

Land area: 1259 square miles.
Population: 11,853 (1920 census).
Location: West side of Sacramento Valley.

Glenn County, standing forty-seventh, owes its position among the mineral-producing counties of the state mainly to the presence of large deposits of sand and gravel which are annually worked, the product being used for railroad ballast, etc. In 1917 and 1918, chromite was also an important item. In the foothills in the western portion of the county, deposits of chromite, copper, manganese, sandstone, and soapstone have been found.

Commercial production for 1927 was as follows, being an increase from the $58,391 of the previous year:

Substance	*Value*
Stone, miscellaneous	$63,869

HUMBOLDT

Land area: 3634 square miles.
Population: 37,857 (1920 census).
Location: Northwestern portion of state, bordering on Pacific Ocean.

Humboldt County is almost entirely mountainous, transportation within its limits being vary largely by auto and wagon road, and trail, and until recent years was reached from the outside world by steamer only. The county is rich in mineral resources, among which are brick, chromite, coal, clay, copper, gold, iron, mineral water, natural gas, petroleum, platinum, silver, and miscellaneous stone.

Eight mineral substances, as shown by the table given below, having a total value of $562,802, were produced in 1927, as compared with the 1926 output of $706,670. The main item is the large amount of rock being used in jetty construction at Humboldt Bay (Eureka Harbor).

Humboldt ranks twenty-eighth among the counties of the state for the year.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Gold	--		$1,729
Silver	25	fine oz.	14
Stone, miscellaneous	--		554,963
Other minerals *	--		6,096
Total value			$562,802

* Includes brick, clay (pottery), natural gas, platinum.

IMPERIAL

Land area: 4089 square miles.
Population: 43,383 (1920 census).
Location: Extreme southeast corner of the state.

During 1927 Imperial County produced nine mineral substances having a total value of $350,977, a decrease from the 1926 output of $467,314. Its rank is thirty-ninth. This county contains deposits of cyanite, gold, gypsum, lead, manganese, marble, pumice, salt, silver, sodium, and strontium, largely undeveloped.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	–	$257
Silver	5 fine oz.	3
Stone, miscellaneous	–	129,658
Other minerals *	–	221,059
Total value		$350,977

* Includes brick, copper, cyanite, gypsum, pumice.

INYO

Land area: 10,019 square miles.
Population: 7031 (1920 census).
Location: Lies on eastern border of state, north of San Bernardino County.

Inyo, the second largest county in the state, and containing less than one inhabitant per square mile, is extremely interesting from a mineralogical point of view. It is noted because of the fact that within its borders are located both the highest point, Mount Whitney (elevation 14,502 feet), and the lowest point, Death Valley (elevation 290 feet below sea level), in the United States. In the higher mountainous sections are found many vein-forming minerals, and in the lake beds of Death Valley saline deposits exist.

Inyo's mineral production during the year 1927 reached a value of $2,519,834, standing thirteenth among the counties of the state in this respect. Thirteen different mineral substances were produced. The 1926 production value was $2,835,834. Its mineral resources include antimony, asbestos, barytes, borates, copper, dolomite, gems, gold, gypsum, lead, marble, soda, sulphur, talc, tungsten, and zinc.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Copper	30,010 lbs.	$3,931
Gold	-----	10,109
Lead	2,173,032 lbs.	136,901
Pumice	344 tons	2,496
Silver	83,570 fine oz.	47,384
Soda	53,328 tons	1,293,379
Stone, miscellaneous	-----	6,000
Talc	7,009 tons	99,416
Other minerals *	-----	920,218
Total value		$2,519,834

* Includes borates, building stone (tuff), dolomite, gems, lime.

KERN

Land area: 8003 square miles.
Population: 54,843 (1920 census).
Location: South-central portion of state.

Kern County, because of its immensely productive oil fields, for many years stood preeminent among all counties of California in the value of

its mineral output, the exact figures for 1927 being $64,729,488. Kern was surpassed by both Los Angeles and Orange counties in 1923, but by Los Angeles, only, in 1924–1927, for which petroleum also is responsible. The 1926 mineral output for this county was worth $83,556,074. The decrease was due to a smaller quantity and lower prices of crude oil. During 1927 seventeen different mineral substances were produced.

Among the mineral resources, developed and undeveloped, of this section are antimony, asphalt, borax, brick, clay, cement, copper, feldspar, fuller's earth, gems, gold, gypsum, iron, lead, limestone, magnesite, marble, mineral paint, natural gas, petroleum, potash, pumice, salt, silica, silver, soapstone, soda, sulphur, and tungsten.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Brick	4,835	M	$50,438
Gold	-----		171,100
Natural gas	39,401,478	M cu. ft.	2,057,807
Petroleum	51,570,412	bbls.	58,738,699
Salt	14,960	tons	69,839
Silver	15,753	fine oz.	8,932
Stone, miscellaneous	-----		79,510
Other minerals *	-----		3,553,163
Total value			$64,729,488

* Includes borax, cement, clay (pottery), copper, feldspar, gypsum, lime, onyx, pumice.

KINGS

Land area: 1559 square miles.
Population: 22,031 (1920 census).
Location: South-central portion of the state.

Little development has taken place in Kings County along mineral lines to date. Deposits of fuller's earth, gypsum, mineral paint, natural gas, and quicksilver, of undetermined extent, have been found in the county. Drilling for oil has been under way, and commercial output recorded for the first time in 1926.

Tulare Lake is in Kings County, though now largely drained, and the land under cultivation.

In fifty-seventh place, commercial mineral production in this county for 1927 was as follows:

Substance	*Value*
Unapportioned *	$1,599

* Includes natural gas and petroleum.

LAKE

Land area: 1278 square miles.
Population: 5542 (1920 census).
Location: About fifty miles north of San Francisco Bay and the same distance inland from the Pacific Ocean.

On account of its topography and natural beauties, Lake County is sometimes referred to as the Switzerland of America. The mineral resources which exist here are many and varied, actual production being comparatively small, as shown by the table below, and in the past

composed mainly of quicksilver and mineral water. Some of the leading minerals found in this section, in part as yet undeveloped, are asbestos, borax, chromite, clay, copper, gems, gold, gypsum, mineral water, quicksilver, silver, and sulphur.

In forty-sixth place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Mineral water	45,643 gals.	$51,149
Natural gas	440 M cu. ft.	220
Quicksilver	245 flasks	29,234
Stone, miscellaneous	---	4,445
Total value		$85,048

LASSEN

Land area: 4531 square miles.
Population: 8507 (1920 census).
Location: Northeast portion of state.

Lassen County is one of the only partly-developed sections of California. Since about 1912 a railroad traversing the county north and south has been in operation, thus affording opportunity for development along mineral and other lines.

Among the mineral resources of this county are copper, gems, gypsum, gold, silver, and sulphur. In the past, some gold had been produced, but not for some years, until 1921, when the yield again became important. In fifty-first place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	--	$531
Granite	--	1,000
Silver	16 fine oz.	9
Stone, miscellaneous	--	47,885
Total value		$49,425

LOS ANGELES

Land area: 4067 square miles.
Population: 936,438 (1920 census).
Location: One of the southwestern coast counties.

Mineral production in Los Angeles County for the year 1927 amounted in value to $131,832,441, as compared with the 1926 output worth $194,358,926. This accounts for 36% of the entire state's total for 1927, and ranks Los Angeles County first in the state as a mineral producer, having in 1923 passed Kern County, which had been leading for several years. The decrease in 1927 was due to lower petroleum prices, and a slight decrease in quantity.

Its output of brick and tile was over three million dollars, and that of petroleum amounted to over one hundred fourteen million dollars. Among the mineral resources may be noted asphalt, barytes, borax, brick, clay, fuller's earth, gems, gold, gypsum, infusorial earth, limestone, marble, mineral paint, mineral water, natural gas, petroleum, salt, glass-sand, sandstone, serpentine, silver, soapstone, and miscellaneous stone. Some potash has been obtained from kelp.

Commercial production for 1927, consisting of 20 substances, was as follows:

Substance	*Amount*		*Value*
Brick	214,332	M	$2,714,398
Building tile (hollow)	28,950	tons	288,471
Clay (pottery)	147,621	tons	206,175
Gold	------		2,345
Lead	312,645	lbs.	19,697
Mineral water	3,934,525	gals.	260,198
Natural gas	59,749,559	M cu. ft.	7,117,081
Petroleum	103,625,615	bbl.	114,583,011
Silver	26,135	fine oz.	14,819
Stone, miscellaneous	------		6,292,078
Other minerals *	------		334,168
Total value			$131,832,441

* Includes copper, building stone (tuff), diatomaceous earth, iron ore, limestone, magnesite, salt, titanium, zinc.

MADERA

Land area: 2112 square miles.
Population: 12,203 (1920 census).
Location: East-central portion of state.

Madera County produced six different mineral substances during the year 1927, having a total value of $1,059,666, as compared with the 1926 output worth $425,738, the increase being due to granite. This county contains deposits of copper, gold, granite, iron, lead, molybdenum, pumice, silver, and miscellaneous stone.

In twenty-fourth place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	--	$4,181
Silver	67 fine oz.	38
Other minerals *	--	1,055,447
Total value		$1,059,666

* Includes granite, paving blocks miscellaneous stone.

MARIN

Land area: 529 square miles.
Population: 27,342 (1920 census).
Location: Adjoins San Francisco on the north.

Mineral production in Marin County during 1927 amounted to $527,004 compared withh $527,553 in 1926.

This county is not especially prolific in minerals, although among its resources along these lines are brick, gems, manganese, mineral water, soapstone, and miscellaneous stone.

In thirtieth place, commercial production for 1927 was:

Substance	*Value*
Stone, miscellaneous	$381,256
Other minerals *	145,748
Total value	$527,004

* Includes brick and mineral water.

MARIPOSA

Land area: 1453 square miles.
Population: 2775 (1920 census).
Location: Most southerly of the Mother Lode counties. East-central portion of state.

Mariposa County is one of the distinctly 'mining' counties of the state, although it stands but thirty-first on the list of counties in regard to the value of its mineral output for 1927, with a total of $499,878, as compared with the 1926 figure of $319,724, the increase being due mainly to stone and barytes.

Its mineral resources are varied; among the more important items being barytes, copper, gems, gold, lead, marble, silver, slate, soapstone, and miscellaneous stone.

The Yosemite Valley is in Mariposa County.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	----	$183,805
Granite	----	2,000
Silver	2,427 fine oz.	1,376
Stone, miscellaneous	----	259,677
Other minerals *	----	53,020
Total value		$499,878

* Includes barytes, pyrites, slate.

MENDOCINO

Land area: 3453 square miles.
Population: 24,116 (1920 census).
Location: Joins Humboldt County on the south and bounded by the Pacific Ocean on the west.

Mendocino's annual mineral production has usually been small, the 1927 output being valued at $47,670, ranking it fifty-second among the counties. That of 1926 was worth $15,800, the increase being due mainly to miscellaneous stone.

Deposits of in part undetermined value of asbestos, chromite, coal, copper, graphite, magnesite, and mineral water have been found, as well as traces of gold, platinum, and silver.

Commercial production for 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$44,630
Other minerals *	3,040
Total value	$47,670

* Includes brick and natural gas.

MERCED

Land area: 1995 square miles.
Population: 24,579 (1920 census).
Location: About the geographical center of the state.

Merced County as a whole lies in the San Joaquin Valley and it figures as one of the lesser mineral producing counties of the state.

The 1927 mineral output was valued at $366,873, compared with $192,665 in 1926, the increase being due to cement.

Gold, platinum, and silver were formerly obtained in important amounts by dredging, which ceased in this county in 1918, though a small yield from other sources is still occasionally had. Undeveloped deposits of antimony, magnesite, quicksilver, and limestone have been noted in this county in addition to the foregoing.

In thirty-sixth place, the commercial production during 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$189,537
Other minerals *	177,336
Total value	$366,873

* Includes brick and hollow building tile, cement, clay (pottery).

MODOC

Land area: 3823 square miles.
Population: 5425 (1920 census).
Location: The extreme northeast corner of the state.

Modoc County, like Lassen, has only in recent years had the benefit of communication with the outside world by rail. Among its known mineral resources are clay, coal, gold, iron, quicksilver, salt, and silver.

In forty-ninth place, commercial production for 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$61,651
Other minerals	600
Total value	$62,251

MONO

Land area: 3030 square miles.
Population: 960 (1920 census).
Location: Is bordered by the state of Nevada on the east and is about in the central portion of the state measured on a north and south line.

Gold mining has been carried on in portions of Mono County for many years, although, taken as a whole, it lies in a somewhat inaccessible country so far as rail transportation is concerned. It is in the continuation of the highly mineralized belt which was noted in Inyo County and contains among other mineral resources barytes, clay, copper, gold, limestone, molybdenum, pumice, salt, silver, and travertine.

In forty-fifth place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	-----	$3,686
Lead	4,830 lbs.	304
Silver	38,487 fine oz.	21,822
Other minerals *	-----	76,375
Total value		$102,187

* Includes clay (pottery), copper, pumice, salt, sillimanite-andalusite, miscellaneous stone.

MONTEREY

Land area: 3330 square miles.
Population: 27,980 (1920 census).
Location: West-central portion of state, bordering on Pacific Ocean.

Monterey County produced twelve mineral substances during the year 1927, having a total value of $351,049, as compared with the 1926 output, worth $359,049. Its mineral resources include brick, clay, copper, coal, diatomaceous earth, dolomite, feldspar, fuller's earth, gold, gypsum, limestone, mineral water, petroleum, quicksilver, glass-sand, sandstone, silver, and miscellaneous stone.

In thirty-eighth place, commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Clay (pottery)	1,100	tons	$550
Gold	----		500
Silver	4	fine oz.	2
Stone, miscellaneous	----		244,584
Other minerals *	----		105,413
Total value			$351,049

* Includes diatomaceous earth, dolomite, salt, 'sandstone' (shale building stone).

NAPA

Land area: 783 square miles.
Population: 20,678 (1920 census).
Location: Directly north of San Francisco Bay—one of the 'bay counties.'

Napa, because of its production of structural and industrial materials and mineral water, stands thirty-fourth on the list of mineral-producing counties in California. Its mineral resources include chromite, copper, magnesite, mineral water, quicksilver, sandstone, and miscellaneous stone. In the past this county has been one of the important producers of quicksilver.

In 1927 the value of the output increased to $417,229 from the 1926 figure of $341,571, the increase being due to quicksilver.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Gold	-----		$7,235
Mineral water	81,864	gals.	50,116
Quicksilver	776	flasks	88,425
Silver	99,532	fine oz.	56,435
Stone, miscellaneous	-----		209,996
Other minerals *	-----		5,022
Total value			$417,229

* Includes copper and sandstone.

NEVADA

Land area: 974 square miles.
Population: 10,860 (1920 census).
Location: North of Lake Tahoe, on the eastern border of the state.

Nevada, one of the mountain counties of California, for some years alternated with Amador in the gold lead, but both were passed by Yuba

in 1918–1921, also 1923. In 1922 and 1924, Nevada led, but dropped to third place in 1925, regaining second in 1926. Nevada County stands fifteenth on the list in regard to value of its total mineral output for 1927 with a figure of $2,213,709 as compared with the 1926 production worth $3,240,211. The decrease is due mainly to miscellaneous stone, but in part to gold.

While this county actually produces mainly gold and silver, its resources cover a wide scope, including antimony, asbestos, barytes, chromite, clay, copper, gems, iron, lead, mineral paint, pyrites, soapstone, and tungsten.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	-----	$2,127,195
Silver	48,644 fine oz.	27,581
Stone, miscellaneous	-----	15,000
Other minerals *	-----	43,933
Total value		$2,213,709

* Includes barytes, copper, granite, lead.

ORANGE

Land area: 795 square miles.
Population: 61,375 (1920 census).
Location: Southwestern portion of state, bordering Pacific Ocean.

Orange County is one of the many in California which on casual inspection appears to be anything but a mineral producing section. It stood for several years, however, as the second county in the state in regard to the total value of mineral output, on account of its highly productive oil fields. It was passed in 1922 by Los Angeles, the credit for which is also due to oil, and in turn Orange passed Kern County in 1923, but dropped back to third in 1924–1926.

This county shows a mineral production for 1927 of $60,547,041, compared to the 1926 output, worth $63,223,082, the decrease due to lower petroleum prices. Orange passed Shasta County in 1917, which previously for a number of years had exceeded all other counties in California, except Kern.

Aside from the substances actually produced and noted in the table below, coal, gypsum, iron, infusorial earth, sandstone, and tourmaline have been found in Orange County.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick	1,283 M	$13,143
Clay (pottery)	14,637 tons	49,354
Natural gas	50,981,982 M cu. ft.	3,910,501
Petroleum	46,593,842 bbl.	56,238,767
Stone, miscellaneous	---------	325,676
Other minerals *	---------	9,600
Total value		$60,547,041

* Includes barytes and quicksilver.

PLACER

Land area: 1395 square miles.
Population: 18,584 (1920 census).
Location: Eastern border of state directly west of Lake Tahoe.

While standing only thirty-seventh on the list of mineral producing counties, Placer contains a wide variety of mineral substances, some of

which have not been commercially exploited. Its leading products include gold, chromite, granite, copper, and clay. Other mineral resources are asbestos, brick, coal, gems, iron, lead, limestone, magnesite, manganese, marble, quartz crystals, glass-sand, silver, and miscellaneous stone.

Commercial production for 1927 was as follows, compared to a total value of $480,882 for the preceding year:

Substance	*Amount*	*Value*
Clay (pottery)	61,388 tons	$106,710
Gold	-----	97,494
Granite	8,590 cu. ft.	18,109
Silica	2,700 tons	8,100
Silver	776 oz.	440
Stone, miscellaneous	-----	40,357
Other minerals	-----	89,014
Total value		$360,224

PLUMAS

Land area: 2594 square miles.
Population: 5681 (1920 census).
Location: Northeastern border of state, south of Lassen County.

A considerable portion of the area of Plumas County lies in the high mountains, and deposits of the metals, especially gold and copper, are found there. Mineral production for 1927 was valued at $3,260,723, the decrease being due to copper and silver. This placed the county tenth in rank. In 1919 Plumas passed Shasta in the copper lead, owing to the Shasta smelters being closed down, which position Plumas still retains.

Among its mineral resources are chromite, copper, gold, granite, iron, lead, limestone, manganese, molybdenum, platinum, silver, and zinc.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Copper	21,055,425 lbs.	$2,758,261
Gold	---------	321,016
Silver	315,887 fine oz.	179,108
Other minerals *	---------	2,338
Total value		$3,260,723

* Includes granite, lead, lime.

RIVERSIDE

Land area: 7240 square miles.
Population: 60,297 (1920 census).
Location: Southern portion of state.

Riverside is the fourth county in the state in size and the seventh in regard to the total value of mineral output for 1927. Within its borders are included mountain, desert, and agricultural land. Its mineral resources include metals, structural and industrial materials, and salines, some of the more important being brick, clay, coal, copper, feldspar, gold, gypsum, iron, lead, limestone, manganese, magnesite, marble, mineral paint, mineral water, salt, soapstone, silver, miscellaneous stone, and tin. In point of variety, Riverside County showed seventeen different minerals commercially produced in 1927. The increase in 1927 from the 1926 value of $6,194,253 was due to cement, brick, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and hollow building tile	------	$696,795
Clay (pottery)	118,510 tons	198,330
Copper	19,201 lbs.	2,515
Gold	------	1,492
Lead	121,667 lbs.	7,665
Silica (quartz)	14,262 tons	60,991
Silver	3,385 fine oz.	1,919
Stone, miscellaneous	------	1,244,034
Other minerals *	------	4,329,619
Total value		$6,543,369

* Includes cement, feldspar, granite, gypsum, limestone, mineral water, onyx, zinc.

SACRAMENTO

Land area: 983 square miles.
Population: 90,978 (1920 census).
Location: North-central portion of state.

Sacramento stands fourteenth among the counties of the state as a mineral producer, the output, principally gold, for 1927 being valued at $2,348,916, as compared with the 1926 production worth $2,243,952.

In regard to gold output alone, this county ranks fourth, being exceeded only by Yuba, Nevada and Amador counties, the Sacramento product coming from the dredges. Its mineral resources include brick, clay, gold, granite, natural gas, platinum, silver, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and hollow building tile	----	$295,677
Gold	----	1,211,278
Granite	----	33,600
Silver	2,596 fine oz.	1,472
Stone, miscellaneous	----	754,206
Other minerals *	----	52,683
Total value		$2,348,916

* Includes clay, natural gas, platinum.

SAN BENITO

Land area: 1392 square miles.
Population: 8995 (1920 census).
Location: West-central portion of state.

While nineteenth among the counties of the state in regard to value of total mineral production for 1927, San Benito has led for some years in one important branch of the mineral industry, namely, quicksilver. Cement is also an important item.

Its other mineral resources, many of them undeveloped, include antimony, asbestos, bituminous rock, chromite, coal, dolomite, gems, gypsum, limestone, magnesite, mineral water, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Quicksilver	4,380 flasks	$485,409
Stone, miscellaneous	----	371,050
Other minerals *	----	1,045,395
Total value		$1,901,854

* Includes antimony, asbestos, cement, mineral water, pyrite.

SAN BERNARDINO

Land area: 20,157 square miles.
Population: 73,401 (1920 census).
Location: Southeastern portion of state.

San Bernardino, by far the largest county in the state in area, ranks fifth as regards the value of its mineral output for 1927 with a total of $16,140,703, as compared with the 1926 total of $14,218,475. The increase is due mainly to cement, in spite of decreases in gold and silver.

San Bernardino for several years (except 1918) has led all other counties in the state in point of variety of minerals, producing commercially during 1927 a total of 23 different substances. This county also ranks first as a silver producer in the state, from the mines of the Randsburg district.

This county, consisting largely of mountain and desert country, is highly mineralized, the following being included among its resources: Asbestos, barytes, borax, brick, cement, clay, copper, gems, gold, granite, gypsum, iron, lead, limestone, manganese, marble, mineral paint, mineral water, nitre, potash, salt, soapstone, soda, miscellaneous stone, strontium, talc, tungsten, vanadium, and zinc.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Cement	5,557,339	bbls.	$9,823,839
Copper	197,135	lbs.	25,824
Fullers earth (filtering clay)	1,798	tons	26,603
Gold	----		82,225
Lead	125,692	lbs.	7,919
Lime	12,170	tons	92,363
Limestone	550,011	tons	348,384
Silver	788,580	fine oz.	447,125
Soapstone	6,544	tons	49,400
Stone, miscellaneous	----		311,470
Other minerals *	----		4,925,551
Total value			$16,140,703

* Includes borates, calcium chloride, clay (pottery), gems, mineral water, onyx, petroleum, potash, salt, silica, tungsten concentrates, soda.

SAN DIEGO

Land area: 4221 square miles.
Population: 112,248 (1920 census).
Location: Extreme southwest corner of state.

San Diego ranks twenty-first in the total value of its mineral output for the year, with 19 different commercial minerals. The value for 1927 equaled $1,619,431, as compared with the 1926 output worth $1,241,324.

In the production of gems, San Diego County has led the state. Aside from minerals commercially produced, as shown below, San Diego County contains occurrences of bismuth, lithia, marble, nickel, soapstone, and tin. Potash has been produced from kelp.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and hollow building tile	-----	$165,170
Clay	16,190 tons	31,765
Fullers earth (filtering clay)	7,396 tons	69,661
Gems	-----	3,500
Gold	-----	11,490
Granite	18,858 cu. ft.	63,142
Mineral water	109,685 gals.	51,559
Silver	162 fine oz.	92
Stone, miscellaneous	-----	889,642
Other minerals *	-----	333,410
Total value		$1,619,431

* Includes bromine, feldspar, heptane, lithia, magnesium chloride, paving blocks, salt.

SAN FRANCISCO

Land area: 46½ square miles.
Population: 506,676 (1920 census).

Surprising as it may appear at first glance, San Francisco County is listed among the mineral producing sections of the state, actual production consisting mainly of crushed rock, sand and gravel. Small quantities of various valuable mineral substances are found here, including cinnabar, gypsum, lignite, and magnesite, none, however, in paying quantities. Some pumice has been produced.

In forty-eighth place, commercial production for 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$62,700

SAN JOAQUIN

Land area: 1448 square miles.
Population: 79,905 (1920 census).
Location: Central portion of state.

San Joaquin County reported a mineral production for the year 1927 having a total value of $711,965, as compared with the 1926 output worth $842,000.

Comparatively few mineral substances are found here, the chief ones being brick, clay, manganese, natural gas, glass-sand, and miscellaneous stone. Gold, platinum and silver have been obtained by dredging in the Mokelumne River, which forms the boundary between this county and Amador on the northeast.

In twenty-seventh place, commercial production for 1927 was as follows:

Substance	*Value*
Brick and hollow building tile	$630,218
Stone, miscellaneous	81,747
Total value	$711,965

SAN LUIS OBISPO

Land area: 3334 square miles.
Population: 21,893 (1920 census).
Location: Bordered by Kern County on the east and the Pacific Ocean on the west.

The total value of the mineral production of San Luis Obispo County in 1927 was $295,030, as compared with the 1926 output worth $253,294, the increase being due to quicksilver.

Among its mineral resources, both developed and undeveloped, are asphalt, bituminous rock, brick, chromite, coal, copper, diatomaceous earth, gypsum, iron, limestone, marble, mineral water, onyx, petroleum, quicksilver, soda and miscellaneous stone.

In forty-second place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Petroleum	16,709 bbls.	$12,531
Quicksilver	470 flasks	53,600
Stone, miscellaneous	---	195,631
Other minerals *	---	33,268
Total value		$295,030

* Includes brick and hollow building tile, copper, mineral water, volcanic ash.

SAN MATEO

Land area: 447 square miles.
Population: 36,781 (1920 census).
Location: Peninsula, adjoined by San Francisco on the north.

San Mateo's most important mineral products are cement, stone and salt, the last-named being derived by evaporation from the waters of San Francisco Bay. The total value of all mineral production during 1927 equaled $1,863,838, as compared with the 1926 figures of $1,893,853.

Small amounts of barytes, chromite, infusorial earth, and quicksilver have been noted in addition to the items of economic value given below. Bricks have also been produced commercially.

In twentieth place, commercial production for 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$129,802
Other minerals *	1,734,036
Total value	$1,863,838

* Includes cement, limestone, natural gas, petroleum, salt.

SANTA BARBARA

Land area: 2740 square miles.
Population: 41,097 (1920 census).
Location: Southwestern portion of state, adjoining San Luis Obispo on the south.

Santa Barbara County owes its position of eleventh in the state in regard to its mineral output to the presence of productive oil fields within its boundaries. The total value of its mineral production during the year 1927 was $2,699,296, as compared with the 1926 output of $2,583,548, and included eleven different mineral substances. The increase was due to petroleum and diatomaceous earth.

Aside from the mineral substances listed below, Santa Barbara County contains asphalt, gilsonite, gypsum, magnesite, and quicksilver in more or less abundance.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Natural gas	1,701,715 M cu. ft.	$204,775
Petroleum	2,173,887 bbls.	1,630,415
Stone, miscellaneous	---	139,093
Other minerals *	---	725,013
Total value		$2,699,296

* Includes bituminous rock, brick and hollow building tile, clay, diatomaceous earth, mineral water, sandstone, shale oil.

SANTA CLARA

Land area: 1328 square miles.
Population: 100,588 (1920 census).
Location: West-central portion of state.

Santa Clara County reported a mineral output for 1927 of $990,876 as compared with the 1926 figures of $1,028,506.

This county, lying largely in the Coast Range Mountains, contains a wide variety of mineral substances, including brick, chromite, clay, limestone, magnesite, manganese, mineral water, petroleum, quicksilver, soapstone, and miscellaneous stone.

In twenty-fifth place, commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick	20,254 M	$199,472
Clay (pottery)	4,373 tons	4,261
Petroleum	11,994 bbls.	14,212
Stone, miscellaneous	-----	457,703
Other minerals *	-----	315,228
Total value		$990,876

* Includes magnesite and mineral water.

SANTA CRUZ

Land area: 435 square miles.
Population: 26,269 (1920 census).
Location: Bordering Pacific Ocean, just south of San Mateo County.

The mineral output of Santa Cruz County, a portion of which is itemized below, amounted to a total value of $3,473,209, giving the county a standing of ninth among all others in the state in this regard. This is a slight decrease from the 1926 figure of $3,504,194.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Lime	13,431 tons	$173,207
Limestone	16,717 tons	38,045
Stone, miscellaneous	-----	45,570
Other minerals *	-----	3,216,387
Total value		$3,473,209

* Includes bituminous rock and cement.

SHASTA

Land area: 3858 square miles.
Population: 13,311 (1920 census).
Location: North-central portion of state.

Shasta County stood eighteenth in California among the mineral producing counties for 1927, with an output valued at $1,950,088, as compared with the 1926 production worth $2.886,144, the decrease being due to zinc, and in part to gold.

The marked decrease since 1918 is due to the falling off in the output of copper, the large plants of the Mammoth and Mountain copper companies being shut down. Not taking petroleum into account, Shasta for a number of years led all of the counties by a wide margin, but in 1919–1923 was passed by San Bernardino, Plumas, Yuba, Inyo, Sacramento, Nevada, and Amador, among the 'metal' counties, though by only San Bernardino and Plumas of that group in 1925.

Shasta's mineral resources include asbestos, barytes, brick, chromite, coal, copper, gold, iron, lead, lime, limestone, mineral water, molybdenum, pyrites, silver, soapstone, miscellaneous stone, and zinc.

Lassen Peak is located in southeastern Shasta County.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Copper	4,524,906 lbs.	$592,763
Gold	------	191,900
Lead	1,780 lbs.	112
Platinum	25 fine oz.	2,552
Silver	123,967 fine oz.	70,261
Stone, miscellaneous	------	134,678
Other minerals *	------	957,822
Total value		$1,950,088

* Includes diatomaceous earth, limestone, pyrite, talc, zinc.

SIERRA

Land area: 923 square miles.
Population: 1783 (1920 census).
Location: Eastern border of state just north of Nevada County.

Sierra County reported a mineral production of $752,533, mainly of gold and silver, during the year 1927, as compared with the 1926 output worth $569,515, the increase being due to gold. Considering gold output this county stands sixth; and as to total mineral yield twenty-sixth.

Aside from the metals itemized below, Sierra County coutains deposits of asbestos, chromite, copper, iron, lead, platinum, serpentine, and talc.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	----	$678,873
Silver	5,909 fine oz.	3,350
Stone, miscellaneous	----	70,300
Other minerals	----	10
Total value		$752,533

SISKIYOU

Land area: 6256 square miles.
Population: 18,545 (1920 census).
Location: Extreme north-central portion of state, next to Oregon boundary.

Siskiyou, fifth county in California in regard to size, located in a highly mineralized and mountainous country, ranks forty-first in regard to the value of its mineral output for 1927.

Although this county is traversed by a transcontinental railroad in a north and south line, the mineral-bearing sections are almost without exception far from transportation and other facilities. A large part of the country is accessible by trail only. Future development and exploitation will increase the productiveness of this part of the state to a considerable degree.

Mount Shasta is located in Siskiyou County.

Among Siskiyou's mineral resources are chromite, clay, coal, copper, gems, gold, lead, limestone, manganese, marble, mineral water, pumice, quicksilver, sandstone, silver, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	----	$138,822
Platinum	9 fine oz.	690
Silver	1,033 fine oz.	586
Stone, miscellaneous	----	102,428
Other minerals *	----	56,420
Total value		$298,946

* Includes mineral water and sandstone.

SOLANO

Land area: 822 square miles.
Population: 40.602 (1920 census).
Location: Touching San Francisco Bay on the northeast.

Solano, while mostly valley land, produced mineral substances during the year 1927 to the total value of $1,557,840, ranking twenty-third among the counties of the state, the decrease from the 1926 figures of $1,770,820 being due to cement.

Among her mineral resources are brick, cement, clay, fuller's earth, limestone, mineral water, natural gas, onyx, quicksilver, salt and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Value*
Unapportioned *	$1,557,840

* Includes cement, clay (pottery), mineral water, onyx, travertine, miscellaneous stone.

SONOMA

Land area: 1577 square miles.
Population: 51,990 (1920 census).
Location: South of Mendocino County, bordering on the Pacific Ocean.

Sonoma ranked forty-third among the counties of California during the year 1927, with a mineral production of $265,392, as compared with its 1926 output of $222,586. More paving blocks have been turned out here than in any other section of the state, but this industry has now ceased, owing to the construction of smooth-surface pavements both in the cities and on the highways.

Among Sonoma's mineral resources are brick, chromite, clay, copper, graphite, infusorial earth, magnesite, manganese, marble, mineral paint, mineral water, quicksilver, and miscellaneous stone.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Mineral water	25,428 gals.	$5,889
Quicksilver	373 flasks	43,068
Stone, miscellaneous	---	208,753
Other minerals *	---	7,682
Total value		$265,392

* Includes petroleum and sandstone.

STANISLAUS

Land area: 1450 square miles.
Population: 43,557 (1920 census).
Location: Center of state, bounded on south by Merced County.

Gold has usually been the chief mineral product of Stanislaus County, but it was exceeded in 1918–1919 by manganese, and in 1921–1923 and 1925–1927 by miscellaneous stone. Brick, clay, gypsum, mineral paint, quicksilver, and silver are found here to some extent as well. This county for 1927 ranks thirty-fifth in the state in regard to value of minerals, with an output of $393,089, as compared with $401,997 in 1926, the decrease being due mainly to gold. Gold, platinum, and silver are obtained mainly by dredging.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	---	$120,238
Silver	608 fine oz.	345
Stone, miscellaneous	---	259,806
Other minerals *	---	12,700
Total value		$393,089

* Includes magnesite, mineral paint, platinum.

SUTTER

Land area: 608 square miles.
Population: 10,115 (1920 census).
Location: Bounded by Butte County on the north and Sacramento on the south.

Sutter is one of only two counties in the state which for a number of years reported no commercial output of some kind of mineral substance. In 1917 some crushed rock was taken out, from the Marysville Buttes, also in 1925–1926. There has been some utilization of natural gas. The 1927 mineral yield was valued at $300, being concealed under 'unapportioned.' Both clay and coal exist here, but deposits of neither mineral have been placed on a productive basis.

TEHAMA

Land area: 2893 square miles.
Population: 12,882 (1920 census).
Location: North-central portion of the state, bounded on the north by Shasta.

Tehama stands fifty-fifth among the mineral producing counties of the state for 1927, when its output was valued at $5,350, as compared with the 1926 yield worth $10,340, the decrease being due to brick and chromite.

Among its mineral resources are listed brick, chromite, copper, gold, manganese, marble, mineral water, salt, and miscellaneous stone.

The 1927 yield was distributed as follows:

Substance	*Value*
Stone, miscellaneous	$4,450
Other minerals	900
Total value	$5,350

TRINITY

Land area: 3166 square miles.
Population: 2551 (1920 census).
Location: Northwestern portion of state.

Trinity, like its neighbor, Siskiyou County, requires transportation facilities to further the development of its many and varied mineral resources. Deposits of asbestos, barytes, chromite, copper, gold, mineral water, platinum, quicksilver, silver, and building stone are known here, but with the exception of gold, chromite, copper, quicksilver and platinum, very little active production of these mineral substances has been made as yet. The 1927 output of $555,854 shows a decrease from the 1926 figure of $611,797 due to gold, giving the county rank of twenty-ninth for the year.

Commercial production for 1927 was as follows:

Substance	*Amount*		*Value*
Copper	770,882	lbs.	$100,986
Gold	-----		409,492
Silver	21,739	fine oz.	12,326
Stone, miscellaneous	-----		32,250
Other minerals	-----		800
Total value			$555,854

TULARE

Land area: 4856 square miles.
Population: 59,031 (1920 census).
Location: Bounded by Inyo on the east, Kern on the south, Fresno on the north.

Tulare stands thirty-second on the list of mineral producing counties, the decrease from the 1926 value being due mainly to magnesite.

This county's mineral resources, among others, are brick, clay, copper, feldspar, graphite, gems, limestone, magnesite, marble, quartz, glass-sand, soapstone, miscellaneous stone, and zinc. Tulare for a number of years led the state in magnesite output, except in 1918 when it was passed by Napa County, and since 1921 by Santa Clara.

Commercial production for 1927 was as follows:

Substance	*Value*
Stone, miscellaneous	$15,082
Other minerals *	459,091
Total value	$474,173

* Includes brick, building tile, granite, lime, limestone, magnesite.

TUOLUMNE

Land area: 2190 square miles.
Population: 7768 (1920 census).
Location: East-central portion of state—Mother Lode District.

Tuolumne ranks thirty-third among counties of the state relative to its total value of mineral output for 1927. This county ranks first as a producer of marble in the state. The decrease in the year's valuation to $432,416 for 1927 from the 1926 figure of $615,998 was due mainly to gold.

Chromite, clay, copper, gold, lead, limestone, marble, mineral paint, platinum, soapstone, silver, and miscellaneous stone are among its mineral resources.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Gold	---	$40,209
Silver	533 fine oz.	302
Stone, miscellaneous	---	31,416
Other minerals *	---	360,489
Total value		$432,416

* Includes limestone, marble, slate.

VENTURA

Land area: 1878 square miles.
Population: 28,724 (1920 census).
Location: Southwestern portion of state, bordering on Pacific Ocean.

Ventura is the fourth county in the state in respect to the value of its mineral production for 1927, the exact figure being $30,995,379, as compared with the output for 1926 worth $30,208,369, the increase being due to natural gas and miscellaneous stone notwithstanding a cut in petroleum prices.

Commercial production for 1927 was as follows:

Substance	*Amount*	*Value*
Brick and hollow building tile	------	$31,832
Clay (pottery and oil-well mudding)	354,418 tons	63,120
Natural gas	71,036,201 M cu. ft.	6,951,273
Petroleum	19,996,841 bbls.	23,536,282
Stone, miscellaneous	------	412,872
Total value		$30,995,379

YOLO

Land area: 1017 square miles.
Population: 17,105 (1920 census).
Location: Sacramento Valley, bounded by Sutter on the east and Colusa on the north.

The mineral production from Yolo County during the year 1927 consisted entirely of miscellaneous stone, valued at $17,895, ranking it in fifty-third place. Deposits of undetermined value of iron and sandstone have been discovered within the confines of this county. Quicksilver has also been produced.

YUBA

Land area: 639 square miles.
Population: 10,375 (1920 census).
Location: Lies west of Sierra and Nevada counties; south of Plumas.

Yuba is eighth of the mineral producing counties of the state, and first in regard to gold output for 1925–1927, having passed Nevada and Amador counties in that metal. Iron and clay deposits have been reported in this county aside from the following commercial production shown for the year 1927. The increase over the 1926 figure of $2,921,083 was due mainly to gold obtained by the dredgers, which also yield silver and platinum. The 1921 dredge yield of gold was a record for the county.

The 1927 production of Yuba County was distributed as follows:

Substance	*Amount*	*Value*
Gold	-----	$3,468,201
Silver	11,893 fine oz.	6,743
Stone, miscellaneous	-----	198,688
Other minerals	-----	6,000
Total value		$3,679,632

CHAPTER EIGHT

TOTAL RECORDED MINERAL PRODUCTION BY COUNTIES

Herein in the tabulations following we present the total mineral yield of each county of the state from the earliest available records to and including 1927. These tables were previously printed in MINING IN CALIFORNIA, November, 1922, Chapter of Report XVIII of the State Mineralogist, which included the data to the end of 1921.

In a number of cases it is known that there were productions of specific minerals in the years previous to the earliest years shown in these tabulations; but unfortunately, there are few detailed or accurate records showing county segregations prior to 1894 when compilation of the statistical records of the California State Mining Bureau began. For gold and silver, the published reports of the U. S. Geological Survey and the Director of the Mint give county segregations back to 1880; but, prior to that year, we have only the state total annually. In the case of quicksilver, there are authentic records for all of the important mines, from which we have compiled county tables for the early years.

The "unapportioned" column is necessitated by the fact that in many cases there is but a single operator or mine producing a given mineral in the county. As it is the policy of the Division of Mines and Mining not to reveal the individual's private business without his consent, we combine the values of such products.

Year	Brick		Chromite		Pottery clay		Coal		Manganese	
	M	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1890			[1]397	$534					[1]	
1891			257	344						
1892										
1893										
1894	7,500	$37,500							468	$4,962
1895	12,000	60,000							600	5,400
1896	7,000	35,000							318	3,415
1897	6,500	35,750					21,900	$50,370	504	4,080
1898	7,000	35,000					70,500	176,250	440	2,102
1899	10,000	60,000					80,703	242,109	290	3,090
1900	5,000	40,000					91,731	332,066	130	1,300
1901	9,590	67,130					87,424	262,272	423	4,365
1902	10,000	60,000					67,850	203,550	870	7,140
1903	10,300	82,400					[3]			
1904	10,500	90,000					[3]		60	900
1905	12,000	95,500								
1906	21 345	413,750			10,000	$10,000				
1907	28,770	474,350			12,610	14,299				
1908	1,800	10,800	70	595	16,370	44,822			260	4,680
1909	14,800	140,000	[3]		45,348	205,194				
1910	20,919	195,889	69	552	9,541	63,925				
1911	19,660	153,330	60	500	10,500	8,300				
1912	12,800	133,100							20	360
1913	13,977	122,937			3,000	2,700				
1914	22,668	159,205			5,000	1,000				
1915	14,841	132.765							319	3,652
1916	23,551	315,941	612	7,344	4,060	2,750			562	9,005
1917	and tile	290,033	52	960	6,502	4,524			1,211	30,250
1918		258,812	220	14,600	2,675	3,850			2,746	109,874
1919		369,778	80	1,264	5,011	12,127			[3]	
1920		664,918			3,001	3,762			[3]	
1921		365,853			6,079	7,405			[3]	
1922		[3]			[3]				130	1,020
1923		828,048			2,850	10 422				
1924		763,476			2,482	1,124				
1925		938,375			9,300	11,376				
1926		808,779			5,870	7,183				
1927		587,402			6,593	20,516				
Totals		$8,825,821	[3]1,817	$26,693	166,792	$435,279	[3]420,108	$1,266,617	9,351	$195,59

[1]There was some production of chromite, manganese and salt in Alameda County in the years previous to those here shown, but the separate county figures are not available.

[2]Includes crushed rock, macadam, ballast, rubble, rip-rap, sand, gravel.

[3]See under 'Unapportioned.'

COUNTY, 1890-1927.

Pyrites		Salt		Miscellaneous stone[2], value	Miscellaneous and unapportioned		
Tons	Value	Tons	Value		Amount	Value	Substance
		[1]					
		44,450	$125,125	$73,463	1,265 cu. ft.	$1,000	Building stone.
		43,810	114,575	94,372	500 cu. ft.	300	Sandstone.
		55,826	122,810	69 405			
		61,353	139,830	73,300			
		87,800	155,812	73,845	2,000 cu. ft.	750	Sandstone.
		78,434	137,088	66,512			
		64,718	158,674	107,551	30 tons	180	Magnesite.
4,500	$18,000	114,450	324,136	107,201	13,728 lbs.	2,162	Copper.
					190 tons	1,100	Magnesite.
14,323	53,301	80,000	160,000	182,295	1,500 lbs.	52	Lead.
					100 tons	500	Magnesite.
21,811	88,500	76,877	143,605	200,702	10,000 tons	15,000	Lime.
15,043	62,992	52,990	76,340	284,181			
15,503	63,958	49,100	54,200	449,029			
14,000	56,000	68,450	126,838	496,482	500 tons	1,750	Glass sand.
16,482	54,410	54,922	163,127	512,607	1,416 tons	14,400	Asphalt.
					11,943 tons	143,376	Asphalt.
13,404	70,782	78,462	108,694	465,653	3 tons	48	Soapstone.
					250 tons	625	Glass sand.
8,105	40,516	104,978	214,808	340,208	18,290 tons	241,475	Asphalt.
						233,032	Unapportioned, 1900-09, inclusive.
10,938	53,170	131,868	285,217	408,591	18,290 tons	197,783	Asphalt.
					40 tons	260	Soapstone.
6,340	31,352	121,540	201,542	404,615			
7,267	29,068	126,211	212,150	420,283			
6,029	24,128	129,318	233,388	456,064	5,000 bbls.	5,000	Lime.
9,829	34,696	126,983	292,641	381,135	50 tons	250	Limestone.
					150 tons	1,500	Magnesite.
11,287	45,148	103,768	220,977	457,381	10 tons	20	Limestone
						1,740	Asbestos, chromite, pottery clay.
16,394	65,110	111,206	263,773	403,587		26,657	Limestone, magnesium chloride, magnesite.
[3]		148,846	315,970	413,845		83,141	Lime, limestone, magnesite, magnesium salts, potash, pyrites.
9,113	45,565	130,132	410,345	311,320		19,169	Asbestos, magnesium salts, potash, limestone.
8,978	42,902	157,751	552,178	309,572		16,864	Magnesium salts, manganese, potash.
10,602	55,251	145,368	574,837	620,758		28,354	Magnesium salts, manganese, mineral paint, potash.
13,449	70,669	108,925	370,296	513,641		25,826	Magnesium salts, manganese, mineral paint, potash.
[3]		139,556	434,076	760,422		845,936	Brick, hollow building tile, magnesium, salt, pyrite.
[3]		177,389	585,585	965,465		97,515	Magnesium salts, pyrite.
[3]		189,217	635,653	1,158,886		75,506	Magnesium salts, potash, pyrite.
[3]		180,712	497,692	1,414,398		54,665	Magnesium salts. potash, pyrite.
[3]		202,777	628,470	1,642,618		71,414	Bromine, magnesium salts, pyrite.
[3]		180,623	366,346	1,538,017		65,506	Magnesium salts, potash, pyrite.
[3]233,697	$1,005,527	3,728,810	$9,406,798	$16,177,404		$2,272,856	

ALPINE COUNTY, 1880-1927.

Year	Gold	Silver	Copper		Miscellaneous and unapportioned	
			Pounds	Value	Value	Substance
1880	$17,133	$24,146				
1881	2,000	2,100				
1882	20,000	10,000	70,895	$13,115		
1883	10,000	5,000	[1]			
1884	5,000	4,000				
1885						
1896	400					
1897						
1901	23,568	2,860	8,377	1,319		
1902	10,359	3,770				
1903	2,701	146				
1904	4,827	145				
1905	575					
1909					$5,465	Unapportioned, 1900-1909
1913	537	4				
1914						
1919					100	Crushed rock.
1920	[2]	[2]			680	Miscellaneous stone.
					160	Gold and silver.
1921					925	Miscellaneous stone.
1922					2,800	Miscellaneous stone.
1923						No commercial production.
1924		[2]	[2]		2,552	Lead and stone, miscellaneous.
1925	[2]	[2]			520	Miscellaneous stone.
1926					450	Miscellaneous stone.
1927	146	60			5,100	Miscellaneous stone.
Totals	$97,246	$52,231	79,272	$14,434	$18,752	

[1] "Small production of cement copper" reported in 1883, but record does not show exact figures.
[2] Under 'Unapportioned.'

AMADOR

Year	Gold, value	Silver, value	Coal		Copper		Pottery clay		Lime	
			Tons	Value	Pounds	Value	Tons	Value	Barrels	Value
1880	$1,495,053	$1,953								
1881	1,450,000	1,500								
1882	1,500,000									
1883	1,590,000									
1884	2,000,000	2,000								
1885	2,145,591	3,700								
1886	1,874,062	6,136								
1887	1,979,956	2,069								
1888	1,750,000	3,500	24,404	$36,606						
1889	1,560,975	6,398	30,000	45,000						
1890	1,459,952	9,357								
1891	1,395,962	13,895	21,323	31,984						
1892	1,210,383	8,008								
1893	1,505,973	5,230								
1894	1,331,916	280	15,280	23,020			2,500	$3,000		
1895	1,391,929	1,089	21,323	31,985	16,500	$1,650	9,960	10,285		
1896	1,523,351	3,767	19,775	29,662	30,000	3,000	8,413	27,825		
1897	1,324,472	3,477	20,000	25,000			3,492	9,540		
1898	1,806,363	1,742	18,500	29,550	3,000	300	7,197	8,297		
1899	1,544,868	6,902	18,500	23,125			10,700	10,900		
1900	1,373,788	14,915	27,477	41,215	220,000	34,100	11,500	9,100		
1901	1,823,827	7,444	25,000	30,000	52,000	8,190	10,050	7,100		
1902	1,629,151	2,686	5,450	10,912	130,000	14,620	12,723	13,728		
1903	1,609,744	4,336			10,000	900	22,000	19,460		
1904	2,060,574	4,055			14,000	1,400	20,608	10,770	1,700	$1,700
1905	2,445,815	17,930			10,000	1,560	21,775	20,000	1,000	1,500
1906	2,260,373	14,579			8,648	1,669	26,789	28,119	1,000	1,200
1907	2,116,182	13,515			5,300	1,020	12,465	13,992		
1908	1,876,175	13,239			53,940	3,440	23,322	25,369	800	960
1909	2,298,785	16,701			288,472	36,641	33,563	32,724	1,200	1,440
1910	2,646,246	20,916			151,484	14,386	39,446	49,339	1,400	1,680
1911	2,832,395	28,899			227,848	28,481	43,352	37,359	1,200	1,500
1912	2,796,194	32,037			175,608	28,975	35,100	36,856	800	1,040
1913	2,901,898	18,097			19,023	2,949	39,678	38,653	1,000	1,200
1914	3,082,002	17,032	5,700	10,062	5,251	694	32,223	33,114	1,540	2,008
1915	3,894,125	20,409			4,185	732	40,156	38,879	1,000	1,200
1916	3,660,550	18,705	[1]		12,349	3,038	29,246	31,106	[1]	
1917	3,664,164	21,358	[1]		19,352	5,283	28,970	28,625		
1918	3,249,385	29,590	[1]		[1]		13,562	34,346		
1919	2,920,492	33,254	[1]				[1]			
1920	1,788,793	19,780	[1]				25,719	61,808		
1921	2,167,443	35,460					22,124	46,664		

[1] See under 'Unapportioned.'

COUNTY, 1880–1927.

Marble		Brick		Miscellaneous and unapportioned		
Cu. ft.	Value	M	Value	Amount	Value	Substance
25,941	$35.826					
4,864	6,566					
4,389	5,415					
3,864	6,280					
2,850	3,594					
4,582	7,925					
4,103	5,891				$318,422	Unapportioned, 1900-1909.
2,945	4,630	600	$7,000			
6,300	8,016					
3,074	5,379					
4,785	6,558				750	Glass sand.
2,703	3,950					
				1,000 tons	1,200	Limestone.
				10 tons	1,000	Asbestos.
		2,109	61,369	1,072 lbs.	40	Lead.
				1,000 tons	1,375	Limestone.
		1,429	28,572	2 tons	200	Asbestos.
				41 tons	332	Chromite.
				1,000 tons	1,500	Limestone.
		2,000	30,000	10,100 tons	10,100	Quartz sand.
				11,200 cu. ft.	5,600	Sandstone.
				600 tons	6,000	Soapstone.
		2,000	20,000	90,000 cu. ft.	45,000	Sandstone.
		2,500	25,000	6,000 cu. ft.	3,000	Sandstone.
				700 tons	2,100	Soapstone.
				2,500 cu. ft.	2,500	Sandstone.
				350 tons	2,420	Soapstone.
		2,000	30,000	1,960 tons	3,556	Quartz.
				877 tons	670	Glass sand.
					670	Miscellaneous stone.
					11,237	Other minerals.
				16,888 tons	9,855	Glass sand.
				44 lbs.	2	Lead.
		2,500	50,000	6,250 tons	2,400	Quartz.
				3,960 cu. ft.	1,500	Sandstone.
				610 tons	2,440	Soapstone.
				523 lbs.	25	Lead.
		4,000	80,000	13,339 tons	16,142	Silica.
					1,300	Miscellaneous stone.
					10,950	Other minerals.
				300 tons	3,700	Chromite
				4,341 tons	12,802	Silica.
		[1]		495 tons	2,475	Soapstone.
					1,300	Miscellaneous stone.
		and tile			77,752	Brick, coal, lime, manganese, sandstone.
				65 tons	1,420	Chromite.
			95,345	4,771 tons	20,766	Silica.
					1,200	Miscellaneous stone.
					13,033	Coal, lead, manganese, platinum, soapstone, zinc.
				88 tons	4,400	Chromite.
				13,747 tons	61,724	Silica.
			[1]		6,500	Miscellaneous stone.
					66,695	Brick, coal, copper, manganese, mineral paint, platinum, soapstone.
					142,523	Clay and clay products.
			[1]	8,440 tons	67,366	Silica.
					9,953	Coal, manganese, platinum, sandstone, soapstone.
				6,116 tons	36,432	Silica.
			[1]		680	Miscellaneous stone.
					102,707	Brick, coal, mineral paint, platinum, soapstone.
				1,802 tons	20,646	Silica.
			[1]		1,125	Miscellaneous stone.
					97,126	Brick and platinum.

Year	Gold, value	Silver, value	Coal		Copper		Pottery clay		Lime	
			Tons	Value	Pounds	Value	Tons	Value	Barrels	Value
1922	$2,241,100	$32,287	----	----	----	----	39,572	$68,126	----	----
1923	1,734,133	15,153	----	----	----	----	45,887	58,196	----	----
1924	2,706,508	18,251	[1]	----	[1]	----	64,317	87,444	----	----
1925	2,338,101	16,123	[1]	----	[1]	----	63,889	95,946	----	----
1926	2,167,275	13,422	[1]	----	[1]	----	----	----	----	----
1927	1,922,714	11,319	[1]	----	[1]	----	118,636	165,210	[1]	----
Totals	$100,048,738	$592,395	[1]252,732	$368,121	[1]1,458,060	$193,028	1,019,259	$487,562	[1]12,640	$15,428

[1] See under 'Unapportioned.'
[2] Includes brick and platinum.
[3] Includes brick and soapstone.
[4] Includes brick, coal, copper and lead.
[5] Includes coal, copper, lead and marble.
[6] Includes brick, coal, copper and silica.

COUNTY, 1880-1927—Continued.

Marble		Brick		Miscellaneous and unapportioned		
Cu. ft.	Value	M	Value	Amount	Value	Substance
				865 tons	$5,030	Silica.
					7,300	Miscellaneous stone.
					125,220	Other minerals.[2]
					28,515	Miscellaneous stone.
					119,877	Other minerals.[3]
					3,050	Miscellaneous stone.
					123,612	Other minerals.[4]
					31,100	Miscellaneous stone.
					11,003	Other minerals.[5]
					237,792	Brick and clay (pottery).
		1		1,267 lbs.	101	Lead.
					24,900	Miscellaneous stone.
					8,010	Other minerals.[6]
		1		2,491 lbs.	157	Lead.
					10,400	Miscellaneous stone.
					97,998	Other minerals.[6]
70,400	$100,030		$427,286		$1,991,956	

BUTTE

Year	Diamonds, value	Gold, value	Mineral water		Platinum	
			Gallons	Value	Ounces	Value
1880		$430,501				
1881		650,000				
1882		650,000				
1883		630,000				
1884		680,000				
1885		672,569				
1886		728,160				
1887		632,902				
1888		550,000				
1889		696,628				
1890		268,977				
1891		304,765				
1892		316,999				
1893		307,351				
1894		473,673				
1895		697,261				
1896		749,316	1,900	$775		
1897		667,025	2,160	900		
1898		514,508	2,685	900		
1899		486,846	2,480	1,240		
1900		485,589	15,000	1,515		
1901		864,978	10,400	1,455		
1902		916,782	14,000	1,500		
1903		1,571,507	13,000	1,550	14	$210
1904		1,932,552	12,600	1,512	66	1,000
1905		2,607,500	15,000	1,500	110	1,770
1906		3,016,747	19,500	1,950	26	475
1907		2,786,840	21,400	2,140		
1908		3,139,398	22,450	2,450		
1909		2,987,079	25,400	1,400		
1910		2,487,791				
1911	$150	2,323,396				
1912		2,346,229				
1913	175	2,269,849	1,000	250		
1914	100	1,700,000	1,200	300	119	381
1915	300	1,545,976	5,000	850	126	3,997
1916	357	1,257,231	3,150	1,125	76	3,472
1917	125	922,271	3,500	1,450	119	9,106
1918	125	645,975	3,900	1,680	114	7,723
1919	[2]	378,297	6,532	2,388	33	5,071
1920	400	467,900	6,400	5,200	fine oz. 42	4,714
1921	331	456,760	2,900	4,100	31	2,432
1922	225	491,201	2,835	2,485	30	3,826
1923	[1]	487,393	3,700	3,300	19	2,601
1924	225	484,530	6,000	4,500	20	2,829
1925	[1]	355,289	4,484	2,742	56	9,177
1926	175	287,853	[1]		10	954
1927	275	143,494	[1]		7	499
Totals	$2,963	$30,467,888	339,676	$51,157	1,018	$63,667

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.
[2] See under 'Unapportioned.'
[3] Includes brick, gems (diamonds), copper, lead, natural gas, soapstone.
[4] Includes clay (pottery), mineral water, natural gas, soapstone.
[5] Includes copper, lead, mineral water, natural gas, soapstone.

COUNTY, 1880-1927.

Silver, value	Miscellaneous stone[1], value	Miscellaneous and unapportioned		
		Amount	Value	Substance
$1,247				
1,000				
3,700				
13				
6				
500				
518				
5,815				
229				
610				
5,504				
8,936				
5,390				
7,885		700 M	$4,200	Brick.
9,317		250 M	1,500	Brick.
		150 tons	3,000	Mineral paint.
5,009		300 M	1,800	Brick.
		900 tons	9,900	Mineral paint.
13,082		600 bbls.	600	Lime.
4,634		900 M	7,200	Brick.
		1,500 bbls.	1,500	Lime.
2,219		800 M	5,000	Brick.
		400 bbls.	750	Lime.
		1,200 M	7,200	Brick.
358		250 bbls.	250	Lime.
		190 tons.	250	Limestone.
2,302		670 M	4,020	Brick.
7,134		400 M	3,200	Brick.
10,853		130 M	1,300	Brick.
8,967				
12,708	$7,916			
7,205	32,140	200 M	1,200	Brick.
			107,170	Unapportioned, 1900-1909
6,429	34,932	645 lbs.	27	Lead.
5,102	78,208			
5,567	51,879			
5,163	258,503			
4,000	50,895	513 lbs.	20	Lead.
		90 lbs.	4	Lead.
3,433	67,143		540	Chromite.
		11 lbs.	2	Copper.
3,332	67,892	1,451 tons	13,940	Chromite.
			9,576	Other minerals.
		5,746 tons	104,085	Chromite.
2,991	89,870	378 lbs.	32	Lead.
			329	Copper, manganese, natural gas.
2,410	77,822	3,325 tons	134,535	Chromite.
			2,765	Manganese and natural gas.
1,911	92,765		1,105	Gems and natural gas.
2,253	[2]		161,095	Natural gas and miscellaneous stone.
1,759	203,900		548	Other minerals.
1,890	220,450		548	Other minerals.
1,756	340,250		6,648	Diamonds, natural gas and soapstone.
2,118	138,000		9,548	Natural gas and soapstone.
4,354	156,738		17,878	Other minerals.[3]
2,997	147,604	273 M	4,316	Brick.
			18,046	Other minerals.[4]
371	130,603		17,800	Brick and clay.
			15,097	Other minerals.[5]
$182,977	$2,247,510		$678,524	

Year	Gold, value	Silver, value	Copper		Mineral paint (ochre)		Clay	
			Pounds	Value	Tons	Value	Tons	Value
1880	$320,865	$643	[1]					
1881	800,000	1,200						
1882	670,000							
1883	500,000							
1884	485,000							
1885	527,538	2,558						
1886	639,457	4,926						
1887	640,417	1,477						
1888	580,000	1,500						
1889	592,243	1,071						
1890	618,821	2,499						
1891	738,883	4,860						
1892	794,531	24,441						
1893	1,669,192	122						
1894	2,119,365	5,183	654,866	$64,951	115	$2,530		
1895	1,717,916	77	175,895	16,925				
1896	1,546,398	500	87,557	8,990				
1897	1,439,861	1,745			150	2,400		
1898	1,019,023	3,462	18,400	2,052	100	225		
1899	1,265,564	9,813	165,484	27,586				
1900	1,649,126	80,762	980,934	150,585	400	3,800		
1901	2,024,685	44,687	1,701,389	268,000	125	500		
1902	2,072,939	46,234	2,087,501	251,062	259	778		
1903	1,904,125	68,280	2,246,675	297,263	200	1,000		
1904	1,789,184	65,611	2,592,124	414,399	70	385	100	$100
1905	1,836,816	78,859	3,666,810	572,022	379	1,900	40	300
1906	1,644,234	74,099	5,082,320	956,315			50	250
1907	1,097,974	54,420	3,941,883	609,203				
1908	1,378,511	62,727	4,804,446	555,704	50	250	25	250
1909	1,440,511	71,418	5,438,908	690 632			100	500
1910	1,147,705	82 866	7,345,321	778,369			30	250
1911	1,112,315	67,032	6,190,153	773,769			50	200
1912	962,145	70,748	6,125,415	1,010,693			4,281	4,431
1913	1,175,208	61,076	5,063,187	784,794	28	190	2,000	4,500
1914	1,336,875	60,442	4,468,998	594,377			280	280
1915	1,391,134	53,298	4,031,149	705,451	[2]			
1916	1,356,120	83,643	6,099,509	1,500,479				
1917	1,471,442	87,984	7,720,861	2,107,795	[2]			
1918	871,263	84,150	6,762,882	1,670,432				
1919	1,550,574	35,876	2,049,330	381,175				
1920	1,439,745	16,701	2,112,186	388,642				
1921	1,495,758	10,232	[2]					

[1] The Union Mine at Copperopolis was a producer as early as 1861, but there are no detailed, annual figures available for Calevaras County earlier than here shown.

[2] Under 'Unapportioned.'

COUNTY, 1880-1927

Mineral water		Limestone		Quartz crystals, value	Miscellaneous and unapportioned		
Gallons	Value	Tons	Value		Amount	Value	Substance
				$18,000	717 tons	$3,583	Pyrites.
				17,500			
					3,500 bbls.	5,500	Lime.
					25 tons	375	Chromite.
		3,087	$15,430	10,000	20 tons	300	Chromite.
		3,994	7,635		40 tons	280	Chromite.
					13.9 ozs.	250	Platinum.
		6,872	16,955	10,000			
		14,165	31,446	10,000			
		4,590	11,987			$50,075	Unapportioned, 1900-1909.
		6,283	16,976				
10,000	$5,000	3,943	11,733		220 lbs.	10	Lead.
7,528	3,764						
					2,500 lbs.	25	Graphite.
11,500	5,500	2,000	1,400		7,006 lbs.	308	Lead.
						9,900	Other minerals.
					650 tons	4,550	Chromite.
15,508	6,517				290 tons	2,618	Fuller's earth.
					30 lbs.	1	Lead.
					9 ozs.	294	Platinum.
					163 lbs.	8	Lead.
15,343	5,752					1,900	Miscellaneous stone.
						4,350	Asbestos, fuller's earth, mineral paint, platinum, silica.
					1,636 tons	12,570	Chromite.
					7,238 lbs.	499	Lead.
18,255	7,025				54 ozs.	2,453	Platinum.
						2,503	Miscellaneous stone.
						300	Other minerals.
					1,613 tons	34,245	Chromite.
					6,395 lbs.	550	Lead.
16,985	7,009				20 ozs.	1,433	Platinum.
						2,700	Miscellaneous stone.
						3,992	Clay, fuller's earth, mineral paint, silica, zinc.
					3,830 tons	159,453	Chromite.
10,938	6,069				10 ozs.	598	Platinum.
						420	Miscellaneous stone.
						2,067	Asbestos and lead.
					2,019 lbs.	107	Lead.
4,384	1,034				8 ozs.	1,076	Platinum.
						600	Miscellaneous stone.
						8,116	Other minerals.
					20 fine ozs.	2,002	Platinum.
5,120	512			[1]		2,400	Miscellaneous stone.
						30,048	Quartz crystals and lead.
					12 fine ozs.	876	Platinum.
2,809	791					17,527	Miscellaneous stone.
						17	Copper and lead.

Year	Gold, value	Silver, value	Copper		Mineral paint (ochre)		Clay	
			Pounds	Value	Tons	Value	Tons	Value
1922	$1,413,465	$11,648	[2]				[2]	
1923	1,205,784	7,316	1,598,776	$235,020			[2]	
1924	853,961	7,463	4,724,441	618,902			[2]	
1925	652,433	8,324	4,906,650	696,744			[2]	
1926	576,889	6,229	5,240,927	733,730			[2]	
1927	219,217	3,982	750,909	98,367			[2]	
Totals	$55,755,212	$1,472,184	108,835,886	$17,964,428	[2]1,876	$13,958	6,956	$11,061

[2] Under 'Unapportioned.'

COUNTY, 1880-1927—Continued.

Mineral water		Limestone		Quartz crystals, value	Miscellaneous and unapportioned		
Gallons	Value	Tons	Value		Amount	Value	Substance
					22 fine ozs.	2,150	Platinum.
1,914	$639			[2]		35,590	Miscellaneous stone.
						39,391	Clay (pottery), copper, gems.
1,626	569			[2]		39,825	Miscellaneous stone.
						9,605	Clay, (pottery), quartz crystals, lead, platinum.
1,400	139					83,250	Miscellaneous stone.
						8,704	Clay (pottery), gems (quartz crystals), lead, platinum, silica (quartz), soapstone.
[2]				[2]		78,506	Miscellaneous stone.
						14,611	Clay (pottery), gems (quartz crystals), lead, mineral water, platinum.
[2]				[2]		59,000	Miscellaneous stone.
						433,924	Cement, clay (pottery), gems (quartz crystals), lead, mineral water, soapstone.
					225 tons	5,063	Chromite.
[2]				[2]	4,606 lbs.	290	Lead.
						1,281,795	Cement, clay (pottery), gems (quartz crystals), soapstone, miscellaneous stone.
123,310	$50,320	44,934	$119,062	[2]$65,500		$2,457,078	

COLUSA

Year	Gold and silver, value	Quicksilver		Sandstone	
		Flasks	Value	Cubic feet	Value
1875		700	$58,905		
1876		407	17,908		
1877		466	17,382		
1878					
1879					
1880	[2]$4,908				
1881	3,500				
1882	2,575				
1883	1,000				
1884	1,530				
1885	45,000				
1886	11,617				
1887	7,461				
1888	6,000				
1889	13,626				
1890	2,810				
1891					
1892					
1893	300				
1894				20,000	$7,500
1895		1	40		
1896		58	2,054		
1897		43	1,510		
1898					
1899					
1900		275	12,359		
1901	1,800	235	10,575	88,981	80,082
1902	850	605	26,500	99,395	87,456
1903		510	21,708	146,828	312,500
1904		[3]400	16,526	100,000	290,000
1905		326	12,321	118,954	276,908
1906				88,821	101,802
1907	742	17	648	86,954	78,259
1908	584	21	900	73,284	43,971
1909	[4]	11	545	47,070	24,634
1910	[4]			112,947	56,505
1911	[5]3,118	5	230	101,029	50,027
1912				51,137	15,804
1913				34,927	15,550
1914				16,000	$7,300
1915					
1916		285	26,648	[6]	
1917					
1918					
1919					
1920					
1921					
1922	[4]				
1923					
1924					
1925				[6]	
1926					
1927					
Totals	[6]$107,421	4,365	$226,359	[6]$1,186,327	$1,448,298

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]1880 to 1890, U. S. Mint reports.
[3]Flasks of 75 pounds since 1904; previously 76½ pounds.
[4]Included with Lassen County production.
[5]Includes Lassen County production.
[6]See under 'Unapportioned.'

COUNTY, 1875-1927.

Mineral water		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Gallons	Value		Amount	Value	Substance
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----------	----------	----------	40 tons	$400	Salt.
50,090	$12,530	----------	----------	----------	
31,500	1,620	----------	8 tons	160	Salt.
21,000	1,050	----------	21 tons	439	Salt.
5,000	1,120	----------	20 tons	300	Salt.
53,500	12,350	----------	20 tons	80	Salt.
92,200	20,220	----------	18 tons 270 M	270 2,160	Salt. Brick.
142,305	79,698	----------	18 tons	396	Salt.
174,000	85,900	----------	18 tons	360	Salt.
156,170	38,051	$1,250	18 tons 300 M	180 1,800	Salt. Brick.
160,000	80,000	----------	18 tons	225	Salt.
197,375	49,344	----------	150 tons	1,700	Salt.
254,075	51,233	3,500	16 tons	240	Salt.
200,000	88,000	850	10 tons	125	Salt.
150,000	75,000	620	----------	104,508	Unapportioned, 1900-1909.
150,000	75,000	16,500	----------	----------	
136,300	68,150	16,702	----------	1,596	Unapportioned.
165,330	39,061	15,300	----------	----------	
132,720	32,931	----------	----------	----------	
92,000	24,951	----------	----------	----------	
91,480	15,003	$1,000	----------	----------	
[5]	----------	550	----------	15,605	Mineral paint, mineral water, sandstone.
[5]	----------	600	----------	15,721	Mineral paint and mineral water.
[5]	----------	700	----------	15,700	Chromite, mineral paint, mineral water.
----------	----------	4,900	----------	2,400	Other minerals.
----------	----------	57,488	----------	----------	
----------	----------	80,000	----------	438	Other minerals.
[6]	----------	[6]	----------	79,534	Gold, mineral water, silver, miscellaneous stone.
----------	----------	75,000	----------	----------	
----------	----------	75,167	----------	2,100	Other minerals.
[6]	----------	[6]	----------	103,230	Mineral water, sandstone, miscellaneous stone.
----------	----------	75,167	----------	16,027	Unapportioned.
----------	----------	13,200	----------	7	Unapportioned.
[6]$2,445,045	$851,212	$438,494	----------	$365,701	

CONTRA COSTA

Year	Brick		Coal*		Lime	
	M	Value	Tons	Value	Barrels	Value
1894			35,000	$94,000		
1895			48,635	139,655		
1896	150	$4,500	44,892	118,709		
1897			39,267	105,180		
1898	5,000	25,000	47,000	113,340		
1899			53,013	131,613		
1900			51,248	145,000		
1901			35,000	100,000		
1902	800	11,600	13,960	31,160		
1903	2,600	16,000			5,300	$4,500
1904	9,385	67,495			12,187	10,359
1905	10,979	73,948			20,244	13,925
1906	23,267	169,022				
1907	48,573	403,564			1,413	1,413
1908	55,844	335,737				
1909	41,033	268,122			14,062	15,468
1910	30,284	199,079			17,338	14,750
1911	36,463	271,575			11,872	8,645
1912	32,621	283,718			14,870	12,640
1913	30,411	212,953			150,551	127,968
1914	16,064	129,543	67	268	5,666	4,724
1915	14,915	139,862	[2]			
1916	16,672	148,730	[2]			
1917	and tile	172,653	[2]			
1918	and tile	148,831				
1919		[2]				
1920	13,608	312,398				
1921		[2]				
1922	and tile	307,749				
1923		[2]				
1924	and tile	327,225				
1925		[2]				
1926		[2]				
1927		303,302				
Totals		$4,332,606	[3]368,082	$978,925	253,503	$214,392

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]See under 'Unapportioned.'
[3]Estimated.
*Coal mining began in the Mount Diablo section of Contra Costa County at least as early as 1861, but there are no segregated county figures available earlier than those here shown. For 1867-1882 (inc.), there are records which indicate for the Mount Diablo field a total of approximately 2,500,000 tons, valued at $14,300,000.

COUNTY, 1894-1927.

Limestone		Mineral water		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value	Gallons	Value		Amount	Value	Substance
		7,600	$3,700	$9,000	1,400 tons	$2,200	Pottery clay.
		5,000	1,200				
		9,300	3,100				
		10,000	3,500				
		12,000	1,900				
		12,000	1,900				
		31,200	8,736		31,700 lbs.	3,645	Copper.
18,000	$22,500	78,000	19,500				
		78,000	19,000	23,060			
34,800	43,500	[2]		76,120			
				75,025			
22,038	43,038			210,250	2,057 tons	21,870	Asphalt.
9,140	18,282	109,400	5,470	236,047	9,500 tons	123,500	Asphalt.
					6,000 tons	7,500	Pottery clay.
22,556	42,837	199,800	10,590	233,782	17,085 tons	222,105	Asphalt.
						683,392	Unapportioned, 1900-1909.
22,912	37,064	2,500	375	235,655			
68,708	46,208	206,500	10,325	257,503			
25,879	45,291	200,000	10,000	478,162			
26,259	34,976	192,292	4,989	660,405		921,349	Other minerals.
32,657	43,661	364,288	3,643	308,727		658,755	Other minerals.
11,989	14,565	[3]350,000	4,000	397,330		757,748	Asbestos, cement, coal.
[2]		351,724	6,154	363,753		760,423	Cement, clay, coal, limestone.
		436,265	8,563	322,507		772,934	Cement and coal.
		30,376	3,038	324,884	100 tons	300	Pottery clay.
						847,198	Cement and copper.
		[2]		275,309		193,340	Clay and clay products.
						926,909	Cement and mineral water.
				432,654	1,743 tons	3,319	Pottery clay.
						1,333,682	Cement and mineral water.
		600,300	6,099	415,127		198,248	Clay and clay products.
						1,003,258	Other minerals.
				559,915	7,086 tons	12,910	Pottery clay.
						1,516,738	Cement, limestone, mineral water.
				629,216		281,743	Clay and clay products.
						1,761,985	Cement, limestone, mineral water.
				646,369		1,374,496	Clay (pottery), cement, limestone, mineral water.
				708,159		1,836,020	Clay (pottery), and clay products, cement, limestone, mineral water.
[2]		[2]		766,921		448,584	Clay and clay products.
						1,395,048	Cement, limestone and mineral water.
[2]		[2]		816,140		1,053,314	Cement, clay (pottery), limestone and mineral water.
[2]294,938	$391,922	[2]3,286,545	$135,782	9,462,020		$19,122,513	

DEL NORTE COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Platinum		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
			Ounces	Value		Amount	Value	Substance
1880	$215,403	$300						[3]
1881	60,000							
1882	80,000							
1883	135,000							
1884	100,000							
1885	39,390	9						
1886	76,189							
1887								
1888								
1889	21,800							
1890	900							
1891	5,586							
1892	4,102							
1893	10,352							
1894	8,000							
1895	8,250							
1896	24,150							
1897	16,710							
1898	9,057							
1899	4,450							
1900	3,483							
1901	10,612							
1902	5,450							
1903	7,183							
1904	7,399		1.5	$18				
1905	10,590		1.5	22				
1906	5,945	33						
1907	878	3						
1908	3,488	19				74,787 lbs.	$9,984	Copper.
1909	1,610	52				24,449 lbs.	13,085	Copper.
							20,000	Unapportioned, 1900-09.
1910	2,388	62				26,670 lbs.	3,395	Copper.
1911	1,743	7						
1912	3,940	10						
1913	2,498	16						
1914	2,035	9	14	643	$3,250			
1915	1,018	6			3,500			
1916	405	2	2	73	1,685		267	Chromite and copper.
1917	1,373	8	10	853	2,700	3,275 tons	97,255	Chromite.
							2,151	Other minerals.
1918	565	4	1	97	8,000	7,143 tons	360,485	Chromite.
							2,584	Other minerals.
1919	867	6			6,300		67	Other minerals.
1920					9,000		2,781	Chromite and copper.
1921	[2]	[2]	[2]		5,580		449	Gold, platinum, silver.
1922	[2]	[2]	[2]		5,500		761	Gold, platinum, silver.
1923	1,778	9	[2]		31,368		872	Copper and platinum.
1924	325		[2]		721,720		220	Unapportioned.
1925	681	1			269,650		250	Other minerals.
1926	1,078	4	10	1,132	68,250			
1927	384	1			53,350		240	Other minerals.
Totals	$897,145	$561	40	$2,838	$1,189,853		$511,846	

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.

[2]Gold, copper and chromite were produced in Del Norte County earlier than the years shown, but the amounts are not separable by counties.

[3]See under 'Unapportioned.'

EL DORADO

Year	Gold, value	Silver, value	Copper		Lime	
			Pounds	Value	Barrels	Value
1880	$389,383	$208				
1881	550,000	900				
1882	600,000					
1883	530,000					
1884	575,000	16,000				
1885	35,000					
1886	619,992	1,822				
1887	706,871	365				
1888	650,000	500				
1889	427,638	408				
1890	204,583	275				
1891	173,279	359				
1892	198,321					
1893	294,610	1,220				
1894	366,707	356			10,000	$8,000
1895	700,101	448			28,500	28,500
1896	812,289	534			4,413	4,158
1897	674,626	886			13,500	6,750
1898	501,966	4,174			3,360	3,360
1899	404,497	8,414			7,935	7,935
1900	368,541	25,129	3,125	$500	7,500	6,000
1901	292,036	5,977			11,000	11,000
1902	335,031	52	2,128	319	24,599	16,176
1903	277,304				5,600	7,000
1904	474,994				12,864	7,075
1905	384,735	2,525	160,000	24,960	9,260	6,946
1906	431,746	2,690			19,217	21,138
1907	319,177	2,301		122		16,198
1908	342,033	5,504	603	83	15,921	20,192
1909	238,284	1,299			13,828	14,591
1910	171,304	967			11,300	9,944
1911	133,967	1,010			15,086	12,309
1912	105,565	843			14,023	11,218
1913	62,688	250	693	107		
1914	133,886	654			14,000	12,082
1915	401,288	1,353	417	73	15,911	12,872
1916	361,821	1,496	[2]		[2]	
1917	24,758	85	18,982	5,182	[2]	
1918	28,352	722	22,259	5,498		
1919	30,121	279				
1920	13,379	155				
1921	34,109	301				
1922	47,340	376				
1923	30,264	185				
1924	28,207	153				
1925	40,212	238				
1926	91,789	472			[3]	
1927	82,254	383	[2]			
Totals	$14,700,058	$92,476	[3]208,207	$36,844	[3]257,817	$243,444

[1] In addition to the segregated figures herein given, a large tonnage of limestone is annually shipped from El Dorado County for use in cement manufacture, and whose value is included in the state total for cement.
[2] Includes crushed rock, rubble, rip-rap, sand, gravel.
[3] See under 'Unapportioned.'

COUNTY, 1880-1927.

Limestone		Slate		Miscellaneous stone[2], value	Miscellaneous and unapportioned.		
Tons	Value	Squares	Value		Amount	Value	Substance
[1]							
		1,800	$11,700				
		1,350	9,450				
		500	2,500				
500	$250	400	2,800				
		400	2,800				
		600	4,500				
		3,500	26,250			$251,820	Unapportioned, 1900-09.
		5,100	38,250				
		4,000	30,000				
		6,000	50,000		10 tons	162	Asbestos.
1,050	5,775	4,000	40,000		112 tons	2,625	Asbestos.
		10,000	100,000		20 tons	1,000	Asbestos.
	15,318	7,000	60,000				
		6,000	50,000	$1,600	200 M	8,000	Paving blocks.
		6,961	45,660	530	3,763 tons	5,645	Sand (glass).
		1,000	8,000	2,616	1,200 tons	1,800	Sand (glass).
1,000	1,000			5,465	3,701 lbs.	167	Lead.
				4,375			
				4,678			
				2,600	90 lbs.	4	Lead.
		[3]		7,500		5,250	Slate and soapstone.
[3]				12,000	5,260 tons	72,560	Chromite.
						19,613	Lime and limestone.
					886 tons	1,717	Silica.
						1,480	Copper and soapstone.
[3]				6,200	8,319 tons	167,950	Chromite.
						104,851	Lime and limestone.
					2,684 tons	4,506	Silica.
						70	Other minerals.
96,673	218,120			20,500	11,936 tons	674,856	Chromite.
						11,236	Pyrites, silica, soapstone
					378 tons	6,510	Chromite.
41,025	112,423			1,700	1,600 tons	13,950	Soapstone and talc.
						1,169	Other minerals.
41,109	139,873			5,500	2,640 tons	18,200	Soapstone.
						9,325	Other minerals.
15,296	66,143			2,750	1,652 tons	9,453	Talc.
42,200	113,700			4,250		18,850	Slate and soapstone.
95,274	163,987			5,900	2,670 tons	15,729	Soapstone.
112,156	322,995			2,538	1,498 tons	8,988	Talc.
						32,691	Copper and lime.
228,293	297,127			10,305		4,946	Lime and silica.
59,386	186,702	[3]		17,510		5,613	Lime, silica, slate.
96,733	146,506	[3]		500		15,792	Copper, gems, silica, soapstone, slate.
	$1,819,919	[3]58,611	$481,910	$109,017		$1,486,528	

FRESNO

Year	Gold, value	Silver, value	Copper		Petroleum		Brick		Miscellaneous stone[1], value
			Pounds	Value	Barrels	Value	M	Value	
1880	$143,433								
1881	90,000								
1882	80,000								
1883	100,000								
1884	80,000								
1885	74,500	$2,456							
1886	151,186	2,701							
1887	205,242	274							
1888	200,000	2,800							
1889	185,988	4,629							
1890	49,951	1,816							
1891	82,607	10,396							
1892	[2]112,981	[2]6							
1893	7,118								
1894	8,202								
1895	47,249								
1896	28,235	100			14,119	$56,750			
1897	43,144				70,140	70,840			
1898	27,557				154,000	154,000	2,500	$18,000	
1899	18,142				439,372	439,372	5,500	38,500	
1900	22,346	479			547,960	547,960	4,250	35,062	
1901	21,462		1 159,672	$182,648	525,433	236,444	5,000	35,000	
1902	54,427		3,000,000	345,000	571,233	199,931	6,000	45,000	
1903	21,538	111			2,214,160	730,673	8,000	68,000	$11,038
1904	7,809	4	2,500	319	5,114,958	1,520,847	4,800	32,400	
1905	40,037	9,187	1,440,000	224,640	8,890,000	2,400,300	9,000	60,000	
1906	8,493	83	440,000	88,000	8,402,000	1,974,470	8,000	64,000	
1907	2,401	26	250,000	50,000	9,050,300	3,620,120	9,230	57,350	10,500
1908	1,054	11			10,725,389	5,898,964	13,220	106,960	16,900
1909	17,539	8,503	876,837	111,341	15,406,619	9,243,971	7,950	49,375	28,400
1910	3,373	2,980	486,725	61,999	18,651 470	9,277,241	9,533	76,267	58,089
1911	17,441	81			19,499,611	9,344,085	4,500	28,500	318,911
1912	6,094	23			19,510,932	8,487,255	5,000	40,000	307,158
1913	2,846	15			18,956,965	7,927,736	5,500	44,000	416,437
1914	10,231	31			15,952,190	7,210,389	4,500	36,000	237,963
1915	4,151	246	65,903	11,533	14,021,025	7,641,459	4,750	33,250	193,705
1916	693	69	29,173	7,177	14,594,246	7,530,631	[3]		95,830
1917	5,745	289	40,662	11,101	16,259,797	13,414,333	[3]		136,719
1918	4,795	37			16,068,919	19,138,083	and tile	89,156	244,647
1919	5,540	67			16,091,037	20,805,711	[3]		241,213
1920	7,793	227			15,375,454	22,801,798	12,517	196,756	535,587
1921	13,085	75			12,161,565	18,643,679	[3]		486,057
1922	10,442	87			9,265,529	9,895,582		220,737	600,348
1923	18,519	128			5,061,542	3,593,695	[3]		863,087
1924	32,978	190			10,156,405	11,801,743		95,104	451,540
1925	25,056	151			7,773,665	8,503,390	[3]		457,307
1926	8,595	52			7,340,102	5,982,183		87,493	388,555
1927	17,406	77			7,202,284	5,977,176		89,145	1,118,761
Totals	$2,127,424	$48,470	7,791,472	$1,093,758	306,068,421	$225,070,811		$1,645,965	$7,218,752

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.
[2] To end of 1892, includes Madera County, which was created March 11, 1893.
[3] See under 'Unapportioned.'

COUNTY, 1880-1927.

Mineral water		Magnesite		Natural gas		Miscellaneous and unapportioned		
Gallons	Value	Tons	Value	M cu. ft.	Value	Amount	Value	Substance
						216 tons	$700	Coal.
						500 tons	4,000	Gypsum.
						600 tons	4,800	Gypsum.
1,200	$400					50 tons	400	Gypsum.
1,886	350							
2,000	900					100 tons	600	Gypsum.
2,000	900					16 tons	320	Asphalt.
5,000	4,000						268,534	Unapportioned, 1900-1909.
5,142	5,142							
5,000	4,500							
7,200	7,200					839 tons	10,068	Asphalt.
4,800	2,400	38	$120			579 tons	6,948	Asphalt.
						500 tons	5,500	Asphalt.
						9,000 tons	26,000	Clay
		850	8,500			400 tons	4,400	Asphalt.
		1,400	22,400			200 tons	2,600	Asphalt.
							750	Gems.
		220	2,195				250	Gems.
						50 tons	950	Chromite.
		2,000	20,000	200,000	$21,380		700	Gems.
						336 flasks	14,125	Quicksilver.
		1,135	9,080	236,100	23,610	375 flasks	15,086	Quicksilver.
				250,000	15,000	148 flasks	7,259	Quicksilver.
						1,300 tons	13,600	Chromite.
				2,894,834	253,906		450	Other minerals.
						9,060 tons	151,824	Chromite.
						11,000 cu. ft.	25,000	Granite.
[3]		5,829	49,082	2,346,917	163,941	668 lbs.	46	Lead.
							36,900	Brick, fuller's earth, mineral water.
						6,289 tons	109,292	Chromite.
[3]		6,077	57,422	4,097,626	347,501		31,500	Granite.
							44,150	Asbestos, brick, mineral water, quicksilver.
						2,314 tons	86,181	Chromite.
		1,795	16,151	5,009,327	267,123		26,800	Granite.
						35 flasks	3,652	Quicksilver.
		600	5,950	5,191,287	411,356		34,500	Granite.
							140,128	Chromite and brick.
		906	8,725	3,721,313	201,865		49,600	Granite.
							17,000	Other minerals.
							125,276	Clay and clay products.
		945	9,540	1,886,081	190,181		28,610	Granite.
							2,000	Other minerals.
							28,600	Granite.
				1,694,090	89,277		8,360	Other minerals.
							217,880	Clay and clay products.
				1,599,354	122,702		64,920	Granite.
							2,400	Other minerals.
				1,430,708	102,286		60,447	Granite.
							3,600	Other minerals.
				1,515,889	116,711		63,580	Granite.
							98,801	Clay and clay products mineral water.
[3]				1,920,489	153,726	17,880 cu. ft.	78,624	Granite.
							800	Other minerals.
				1,682,652	148,227	17,186 cu. ft.	74,424	Granite.
							2,000	Other minerals.
[3]34,288	$25,792	21,795	$209,165	35,676,667	2,626,732		$2,004,935	

GLENN COUNTY, 1893-1927.

Year	Amount	Value	Substance
1893 and previous	3,319 long tons	$49,700	Chromite.
1909	140,000 tons	49,000	Macadam.
1910	378,000 tons	34,020	Rubble.
1911	421,775 tons	51,430	Sand and gravel.
1912	543,675 tons	32,950	Sand and gravel.
1913	416,640 tons	27,776	Sand and gravel.
1914		30,553	Miscellaneous stone.
1915	746 lbs.	131	Copper.
		46,526	Miscellaneous stone.
		10	Other minerals.
1916		41,180	Miscellaneous stone.
		39,982	Other minerals.
1917	879 tons	21,474	Chromite.
	369 tons	9,721	Manganese.
		33,260	Miscellaneous stone.
		817	Other minerals.
1918	1,129 tons	57,263	Chromite.
		32,436	Miscellaneous stone.
1919		58,137	Miscellaneous stone.
		1,500	Other minerals.
1920		134,707	Miscellaneous stone.
1921		103,197	Miscellaneous stone.
1922		91,250	Miscellaneous stone.
1923		113,282	Miscellaneous stone.
1924		41,550	Miscellaneous stone.
1925		92,288	Miscellaneous stone.
1926		58,391	Miscellaneous stone.
1927		63,869	Miscellaneous stone.
Total		$1,316,400	

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HUMBOLDT

Year	Gold, value	Silver, value	Mineral water		Brick	
			Gallons	Value	M	Value
1880	$153,940	$80				
1881	75,000	300				
1882	100,000					
1883	80,000					
1884	115,000					
1885	29,730					
1886	83,591					
1887	111,532					
1888	100,000					
1889	143,701	274				
1890	93,612	82				
1891	99,329	19				
1892	87,515					
1893	66,354					
1894	41,326	14	20,000	$7,200		
1895	92,635		24,000	12,000		
1896	65,093		15,000	10,000		
1897	94,992	57	10,000	2,000		
1898	57,512				300	$2,500
1899	65,059		6,000	1,500	410	3,870
1900	109,444	[1]136	6,000	2,000	795	7,100
1901	98,487	[1]59	7,825	2,000	1,005	7,810
1902	60,015		10,000	2,500	2,170	17,040
1903	38,509				1,060	10,445
1904	62,061				2,565	21,350
1905	45,824				800	7,600
1906	48,295	240			915	8,690
1907	40,109	214			140	1,400
1908	33,066	325			760	8,585
1909	25,690	94			1,310	9,750
1910	35,289	150			476	4,048
1911	34,966	169			357	2,880
1912	31,271	150			772	6,415
1913	25,611	132			500	4,150
1914	18,686	57			607	6,120
1915	15,947	62	2,000	500	463	5,565
1916	21,279	55	3,000	750	[2]	
1917	23,086	95	[2]		[2]	
1918	8,028	72	[2]		[2]	
1919	16,260	134	[2]		[2]	
1920	2,538	19			[2]	
1921	2,054	37				
1922	1,330	10	[2]		[2]	
1923	2,260	12	[2]		[2]	
1924	1,269	7	[2]		[2]	
1925	13,142	62				
1926	1,243	6				
1927	1,729	14				
Totals	$2,573,409	$3,137	[2]103,825	$40,450	[2]15,405	$135,318

[1]Recalculated to 'commercial' from 'coining value' as originally published.
[2]See under 'Unapportioned'.
[3]Includes crushed rock, rubble, rip-rap, sand, gravel.

COUNTY, 1880-1927

Miscellaneous stone[3], value	Natural gas		Miscellaneous and unapportioned		
	M cu. ft.	Value	Amount	Value	Substance
$199,240					
251,586					
233,454					
193,502					
297,276					
160,845					
				$362	Platinum.
				140	Platinum.
			12.5 ozs.	204	Platinum.
			30.8 ozs.	555	Platinum.
13,074			1,280 cu. ft.	1,280	Granite.
29,170	600	$300	2,450 tons	7,640	Clay.
				20,985	Unapportioned, 1900-1909.
36,700	1,000	500	250 tons	750	Clay.
37,756	300	150	937 tons	937	Clay.
229,730	300	150	396 tons	400	Clay.
439,808	300	150	7,750 lbs.	1,201	Copper.
208,204	300	150	3 ozs.	115	Platinum.
335,292	[2]			1,320	Copper and natural gas.
			7 ozs.	296	Platinum.
60,260	[2]			192,255	Brick, clay, granite, natural gas.
			6 ozs.	351	Platinum.
27,014	[2]			9,312	Brick, clay, mineral water, natural gas, volcanic ash.
			370 tons	21,744	Chromite.
			210 tons	420	Clay.
				116	Granite.
51,082	640	85	1,520 tons	57,751	Manganese.
			2 ozs.	140	Platinum.
				2,516	Brick, mineral water, pumice.
				9,271	Brick and clay.
25,198	[2]			1,148	Mineral water and natural gas.
			859 tons	18,513	Manganese.
133,290	[2]			5,436	Brick, clay, granite, mineral water, natural gas, volcanic ash.
			75 tons	190	Pottery clay
131,688	[2]			4,628	Brick, mineral water, natural gas, platinum, pumice.
				6,399	Brick and clay.
117,308	[2]			153	Mineral water and natural gas.
			4 fine ozs.	413	Platinum.
422,519	[2]			9,915	Clay and clay products, mineral water, natural gas, platinum.
476,449	[2]			7,753	Brick, clay, mineral water, natural gas, platinum.
699,740				6,207	Brick, pottery clay, mineral water, natural gas, platinum.
				4,052	Brick and clay.
700,736				633	Natural gas and platinum.
554,963				6,096	Includes brick, clay, natural gas and platinum.
$6,065,884	[2]3,440	$1,485		$401,482	

IMPERIAL COUNTY, 1907[1]-1927.

Year	Brick		Gold, value	Silver, value	Miscellaneous stone, value	Miscellaneous and unapportioned		
	M	Value				Amount	Value	Substance
1907	1,000	$10,000						
1908	2,225	22,250	$5,848	$123		375 lbs.	$51	Copper.
1909	2,000	20,000	59,705	524				
1910	1,680	10,078	[2]87,341	[2]237				
1911	1,200	7,000	[2]97,855	[2]189				
1912	3,250	20,000			$10,000			
1913	5,500	44,000	31,700	94	12,000	750 cu. ft.	7,260	Marble.
1914	4,900	29,400	210,428	8,961		13,081 lbs.	1,730	Copper.
1915	2,958	17,916	14,369	42	40,095	65 lbs.	11	Copper.
							5,000	Other minerals
1916	[3]		23,338	155	34,834		47,006	Brick, copper, lead, pumice, strontium.
1917	and tile	19,260	919	5	65,660	1,907 tons	38,140	Manganese.
							5,416	Copper, potash, pumice.
1918	and tile	11,670	247	1,248	34,787	1,241 tons	46,900	Manganese.
							14,840	Copper, lead, pumice.
1919	[3]			8,607	63,900		67,936	Brick, lead, pumice, salt.
1920	[3]			2,183	127,412	624 tons	16,500	Pumice.
							23,787	Other minerals.
1921	654	6,363	537	920	171,173		3,825	Other minerals.
1922			350	18,024	154,560		15,805	Brick, gypsum, lead, marble, pumice.
1923					101,833		162,900	Brick, gold, gypsum, pumice, silver, soda (salt cake).
1924			258	1	78,032		61,617	Brick, gems (dumortierite), gypsum, pumice.
1925	[3]		[3]	[3]	148,942		182,023	Brick, cyanite, gypsum and pumice.
1926	[3]		238	19	312,130		154,927	Brick, cyanite, gypsum, lead and pumice.
1927	[3]		257	3	129,658		221,059	Brick, copper, cyanite, gypsum and pumice.
Totals		[3]$217,937	$533,390	$41,335	$1,485,016		$1,076,743	

[1]Imperial County was created August, 1907, from a part of San Diego County.
[2]Includes production of San Diego County.
[3]See under 'Unapportioned'.

Year	Gold, value	Silver, value	Lead		Copper		Zinc		Borax, value
			Pounds	Value	Pounds	Value	Pounds	Value	
1880	$48,648	$173,916							
1881	170,000	140,000							
1882	220,000	130,000							
1883	90,000	38,000							
1884	80,000	82,000							
1885	24,998	73,461							
1886	20,156	101,670							
1887	10,649	103,370							
1888	25,000	75,000							
1889	193,957	30,706							
1890	62,432	88,320							
1891	35,466	112,730							
1892	13,930	35,995							
1893	25,945	52,475							
1894	52,639	83,640	900,000	$27,000					$81,298
1895	92,142	188,329	1,498,000	46,438					40,000
1896	238,507	108,619	1,220,000	36,600					24,900
1897	159,840	50,063	564,000	19,176					
1898	137,107	73,503	580,000	21,170	49,829	$3,986			33,000
1899	114,187	57,529	662,000	28,135					24,000
1900	213,655	113,483	971,000	38,810					13,901
1901	162,406	56,573	601,000	24,040	8,566	1,349			24,250
1902	74,397	14,484	257,500	9,013	1,100	126			36,394
1903	66,045	18,200	95,000	3,420	23,450	3,098			26,400
1904	150,474	7,122	124,000	5,270	25,508	3,252			
1905	135,959	29,741	345,680	16,247	151,606	23,649			
1906	19,449	13,358	208,018	11,857	4,145	800			
1907	57,241	44,440	261,140	13,096	6,779	1,356	144,213	$8,598	*
1908	308,873	30,900	683,401	28,244	6,820	938			*
1909	457,486	47,117	2,364,137	131,199	39,888	5,073			*
1910	408,509	129,590	2,866,227	127,385	58,801	7,489			*
1911	574,945	45,678	1,182,122	53,195	27,889	3,486	*		*
1912	369,758	45,316	1,267,593	54,342	48,584	8,016	*		*
1913	237,310	136,854	3,322,308	146,182	113,860	17,648	*7,149,523	449,701	*
1914	275,000	255,000	4,626,934	180,450	336,423	44,744	399,641	20,381	*
1915	317,905	127,894	4,323,639	203,211	154,722	27,076	4,625,162	573,520	*8,162,727
1916	131,722	232,441	11,185,321	771,787	274,032	67,412	5,758,703	771,666	[1]
1917	125,394	534,599	19,318,642	1,661,403	175,273	47,850	3,535,000	359,550	[1]
1918	100,240	441,548	12,223,471	867,866	338,518	83,614	2,517,045	229,051	[1]
1919	69,560	194,151	3,643,485	193,105	169,713	31,567	1,192,353	87,042	[1]
1920	55,634	258,929	4,612,338	368,987	144,286	26,549	[1]		
1921	80,373	86,020	1,052,253	47,351	45,725	5,898			
1922	85,265	256,009	6,264,138	344,528	69,537	9,388	[1]		[1]
1923	36,702	265,023	9,541,868	667,931	77,349	11,370			[1]

* Combined to conceal individual annual output.
[1] See under 'Unapportioned.'
[2] Includes antimony, borax, gypsum, marble, molybdenum, salt, tungsten.
[3] Includes asbestos, barytes, borax, gypsum, marble, molybdenum.
[4] Includes borax, dolomite, marble, pumice, salt, soda, talc, tungsten.
[5] Includes borax, dolomite, fuller's earth, marble, volcanic ash, salt, talc, zinc.
[6] Includes borax, building stone, marble, pumice, soda.
[7] Includes borax, building stone, clay (pottery), fuller's earth, limestone, marble, pumice, soda, talc, zinc.
[8] Includes building stone, borates, fuller's earth, gems, marble, pumice, tungsten concentrates.

COUNTY, 1880-1927.

Soda		Soapstone and talc		Marble		Miscellaneous and unapportioned		
Tons	Value	Tons	Value	Cu. ft.	Value	Amount	Value	Substance
1,530	$20,000			12,500	$62,500			
1,900	47,500			10,000	50,000			
3,000	65,000			3,000	24,000			
5,000	110,000							
7,000	154,000			4,000	12,000			
10,000	250,000							
1,000	50,000					20 tons	$700	Antimony.
8,000	400,000							
7,000	50,000							
*	*			20,000	20,000	300 tons	2,400	Salt.
*	*			3,000	3,000	400 tons	800	Salt.
*	*			17,000	17,000			
*	*			1,200	4,800			
*	*			1,000	4,000			
*	*							
*	*						1,417,217	Unapportioned, 1900-1909.
*	*					45,000 tons	31,500	Rubble.
*	*					46,450 tons	32,555	Rubble.
							174	Gems.
*	*	1,050	$5,250				648	Rubble.
*	*	1,000	4,400	3,200	11,500		835	Rubble.
						13,500 tons	54,000	Salt.
*	*	390	2,060	3,500	10,500	13,500 tons	54,000	Salt.
112,937	*496,250	1,513	14,000				80,430	Antimony, dolomite, marble, pumice, salt.
						3,596 tons	14,700	Dolomite.
10,593	264,825	685	4,606	1			23,040	Miscellaneous stone.
							2,317,897	Other minerals[2].
						11,315 tons	22,630	Dolomite.
19,604	861,160	4,736	41,044				3,000	Miscellaneous stone.
							2,639,600	Other minerals[3].
						14,390 tons	32,056	Dolomite.
1		9,635	72,549				5,000	Miscellaneous stone.
						589 tons	854,025	Tungsten cnocentrates.
							2,491,727	Borax, limestone, salt, soda.
						2,360 tons	12,000	Limestone.
1		1					7,850	Miscellaneous stone.
							2,097,271	Other minerals.[4]
						15,240 tons	31,080	Limestone.
23,132	933,023	1		1			1,190	Miscellaneous stone.
							2,214,008	Other minerals[5].
						22,112 tons	49,073	Dolomite.
1		4,350	77,250			1,185 tons	8,295	Fuller's earth.
							16,250	Miscellaneous stone.
							1,089,708	Other minerals.[6]
						43,778 tons	72,284	Dolomite.
1		1		1			12,000	Miscellaneous stone.
							1,358,207	Other minerals.[7]
						47,542 tons	79,793	Dolomite.
24,116	662,747	5,981	104,976	1			19,500	Misce laneous stone.
							997,539	Other minerals.[8]

Year	Gold, value	Silver, value	Lead		Copper		Zinc		Borax, value
			Pounds	Value	Pounds	Value	Pounds	Value	
1924	$19,977	$115,799	4,813,718	$385,098	79,995	$10,479	----------	----------	[1]
1925	43,774	117,763	6,307,105	548,196	73,003	10,367	145,000	$11,020	[1]
1926	26,871	77,693	6,541,741	523,339	42,462	5,945	76,889	5,767	[1]
1927	10,109	47,384	2,173,032	136,901	30,010	3,931	----------	----------	[1]
Totals	$6,430,996	$5,542,445	116,540,811	$7,741,912	2,477,873	$466,456	25,533,529	$2,516,296	$18,466,870

[1] See under 'Unapportioned.'
[9] Includes alum, borates, building stone (tuff), fuller's earth, glauber salt, lime, limestone, magnesium sulphate, pumice, radio galena crystals, soda (ash and bicarbonate), tungsten concentrates.
[10] Includes borates, building stone (tuff), fuller's earth, graphite, limestone, pumice, soda (ash and bicarbonate), tungsten concentrates.
[11] Includes borates, building stone (tuff), dolomite, gems, limestone, salt, tungsten concentrates.
[12] Includes borates, building stone (tuff), dolomite, fuller's earth, lime.

COUNTY, 1880-1927—Continued.

Soda		Soapstone and talc		Marble		Miscellaneous and unapportioned		
Tons	Value	Tons	Value	Cu. ft.	Value	Amount	Value	Substance
						17,197 tons	$37,491	Dolomite.
[1]	----------	5,942	$98,806	--------	----------	----------	12,500	Miscellaneous stone.
						----------	1,429,925	Other minerals.[9]
[1]	----------	5,335	89,134	--------	----------	----------	1,764,891	Other minerals.[10]
						2,275 tons	20,130	Fuller's earth.
60,473	$1,232,081	6,487	98,563	--------	----------	300 tons	1,750	Pumice.
						----------	12,000	Miscellaneous stone.
						----------	831,695	Other minerals.[11]
						344 tons	2,496	Pumice.
53,328	1,293,379	7,009	99,416	--------	----------	----------	6,000	Miscellaneous stone.
						----------	920,218	Other minerals.[12]
348,633	$6,889,965	54,113	$712,054	[13]78,400	$219,300	----------	$22,204,078	

KINGS COUNTY, 1894[1]-1927.

Year	Brick		Gypsum		Natural gas		Quicksilver		Miscellaneous and unapportioned		
	M	Value	Tons	Value	M cu. ft.	Value	Flasks	Value	Amount	Value	Substance
1894											
1895											
1896											
1897											
1898	1,250	$8,450									
1899	1,650	11,550									
1900	750	5 000									
1901	1,000	5,000								$10,500	Unapportioned 1900-1909.
1902	3,500	19,000									
1903	3,400	24,200									
1904	3,100	23,300									
1905	3,400	24,000					*250	$9,000			
1906	2,800	20,000									
1907	1,000	8,000							100 tons	1,000	Fuller's earth.
1908	3,000	24,000	100	$400					50 tons	1,000	Fuller's earth.
1909	1,000	8,500	100	300	360	$360			100 tons	2,000	Fuller's earth.
									20 tons	100	Mineral paint.
1910	400	3,200	100	490	1,200	600	100	4,525	100 tons	1,000	Fuller's earth.
									10 tons	270	Mineral paint.
1911			20	100	1,800	800					
1912			50	200	6,000	1,650					
1913			100	300	1,916	575			20 tons	60	Mineral paint.
										400	Other minerals.
1914			20	80	150	500			20 tons	160	Fuller's earth.
1915					258	608	[2]			18,000	Fuller's earth, quicksilver.
1916					258	608	[2]			26,180	Other minerals.
1917					3,569	2,777					
1918					2,460	590	[2]			8,639	Other minerals.
1919					2,550	1,630	[2]			49,653	Other minerals.
1920					2,765	1,250	436	28,620			
1921					2,090	980	[2]			4,742	Other minerals
1922					1,790	870				5,936	Other minerals.
1923					1,990	970				585	Other minerals.
1924					1,480	725					
1925					740	440				80	Other minerals.
1926					470	245				475	Other minerals.
1927					[2]					1,599	Natural gas and petroleum.
Totals	26,250	$184,200	490	$1,870	31,846	$16,178	[2]786	$42,145		$132,379	

*Flasks of 75 pounds.

[1]Kings County was created March 22, 1893, from a part of Tulare County, and in 1909 extended by annexing a portion of Fresno County.

[2]See under 'Unapportioned.'

Year	Asphaltum		Brick		Copper		Fuller's earth		Gold, value	Lime		Limestone		Silver, value	Natural gas		Petroleum		Miscellaneous and unapportioned		
	Tons	Value	M	Value	Pounds	Value	Tons	Value		Barrels	Value	Tons	Value		M cu. ft.	Value	Barrels	Value	Amount	Value	Substance
1880									$94,214					$390							
1881									190,000					14,000							
1882									260,000					20,000							
1883									150,000					5,000							
1884									100,000					5,000							
1885									72,003												
1886									94,640					1,721							
1887									72,358					150							
1888									60,000					2,500							
1889									242,676					7,517							
1890									117,341					586							
1891									107,735					61							
1892									107,738					73							
1893									83,665					1,754							
1894	6,900	$138,000							310,707	33,000	$26,500			39,700			11,215	$69,334	92 tons	$3,720	Antimony.
1895	1,400	28,000							231,433	25,400	24,980		$10,000	48,064			116	116	33 tons	1,485	Antimony.
1896	2,484	44,680							590,867	37,100	32,329	5,000	5,000	34,650			235	235	15 tons	2,250	Antimony.
1897	4,650	86,350	1,100	$6,600					754,313	53,400	70,370			10,471					25 tons	3,500	Antimony.
1898	1,850	50,000	2,000	14,000					1,017,930	42,000	29,900			6,543			10,000	10,000	220 tons 40 tons	1,100 1,200	Coal. Antimony.
1899	2,537	57,670	1,600	11,400			620	$12,400	863,414	64,700	57,690			6,810			15,000	13,500	27 tons	3,382	Borax.
1900	701	14,020	2,525	17,300	4,000	$750	500	3,750	805,252	57,721	51,700			147,736			919,275	827,348			
1901	3,112	43,126	4,600	23,400	429,248	67,806	1,000	19,500	1,007,059	62,000	82,700			40,497			3,902,125	1,131,816		859,927	Unapportioned, 1900-1909.
1902	10,150	101,500	3,500	24,500	235,840	27,122	987	19,246	1,165,982	99,360	80,856			99,135			9,777,948	1,955,585	1,600 lbs. 50 tons	64 8,350	Lead. Antimony.
1903	8,006	100,787	9,000	30,000	4,300	559	250	4,750	1,022,353	101,661	76,246			114,614			18,001,148	3,600,230	1,000 tons 28 tons	8,000 63	Gypsum Bituminous rock.
1904	12,451	124,110	700	4,900			500	9,500	1,426,523	178,038	172,000			151,189			19,608,045	3,431,408	1,000 tons	8,000	Gypsum.
1905	10,586	105,860	750	6,000					1,160,971	279,650	255,500		44,000	134,944			17,069,715	3,174,966	53 tons 1,350 tons 52 tons 215 tons	54 11,000 18,800 752	Clay. Gypsum. Tungsten. Clay.
1906	23,136	231,360	4,275	34,200					806,117	295,613	267,096			129,503			13,826,000	3,765,200		183,600	Tungsten.
1907	20,443	260,158	2,168	18,428					878,798	175,000	169,822			86,033			15,700,308	4,673,867	1,000 tons	5,500	Gypsum.
1908	50,000	475,000	2,080	19,552					827,087	116,717	87,788			96,550			18,777,871	9,388,935	500 tons	2,000	Gypsum.
1909	54,599	655,391	3,365	29,634			359	5,385	654,799	115,709	88,869			101,633	38,000	$2,714	24,549,758	12,565,246		500	Gems.
1910	76,605	811,846	8,332	63,711					619,974	99,187	86,198		4,331	35,041	975,724	47,364	40,641,159	17,825,212	1,700 tons 4,781 lbs. 1,675 tons 160,000 tons 242 tons	8,300 174 8,305 112,000 121	Gypsum. Lead. Gypsum. Rubble. Clay.
1911			5,603	41,426	29,441	3,680			557,471	96,500	82,025	600	400	5,833	1,654,380	165,438	46,562,825	20,207,906	230,950 tons 853 tons 2,417 lbs. 8,479 tons 19,664 lbs. 208 tons 10,000 tons 1,378 lbs.	107,889 4,245 109 18,188 885 104 22,750 61	Crushed rock. Gypsum. Lead. Gypsum. Lead. Clay. Gypsum. Lead.
1912			1,890	23,120					830,421	162,831	124,894			11,480	4,400,000	325,484	51,448,067	21,762,532		600	Other minerals.
1913			1,625	22,000	3,498	542			649,712	135,600	91,200			11,851	7,111,237	568,899	58,898,432	27,038,474	346 tons 82 tons 379 lbs. 20,000 tons	172 320 15 60,000	Clay. Gypsum. Lead. Salt.
1914			3,834	29,214	7,394	983			594,337	81,600	65,100			8,002	6,508,868	390,532	65,332,633	26,721,046		180,575	Other minerals.
1915					1,047	183			983,319	55,176	39,523	1,425	1,710	13 316	12,163,461	737,638	54,810,669	23,184,913	267 tons 84,371 lbs	11,301 3,965 59,319 299,997	Antimony ore. Lead. Miscellaneous stone. Cement, pottery clay, fuller's earth, gypsum, magnesite, salt, tungsten.
1916			3,177	23,824	24,754	6,089	[1]		747,042	[1]				8,745	16,679,658	1,379,033	54,120,509	34,691,246	145 tons 24,274 lbs. 4 100 tons 193 tons	5,880 1,675 30,047 23,700 63,723 482,387 363,516	Antimony ore. Lead. Lime and limestone. Silica. Miscellaneous stone. Tungsten concentrates. Cement, clay, feldspar, fuller's earth, magnesite, quicksilver, salt.
1917			and tile	22,785	251,225	68,584			537,852	[1]		[1]		7,813	25,819,376	1,445,880	53,065,066	47,387,104	113 tons 9,684 lbs. 300 flasks 49 tons	16,041 833 27,250 31,787 58,148 139,345	Antimony ore. Lead. Quicksilver. Miscellaneous stone. Tungsten concentrates. Clay, feldspar, lime, limestone, magnesite, salt.
1918			1,678	16,380	95,580	23,608			246,127	23,615	23,615	[1]		7,817	23,545,128	1,507,912	49,049,917	61,410,496		311 174,419	Miscellaneous stone. Lead, limestone, magnesite, manganese, quicksilver, salt, tungsten.
1919			1,709	175,112			[1]		150,589	86,952	112,724	[1]		8,402	25,363,739	1,618,913	47,734,035	64,440,947	17,000 tons	81,000 28,320 9,345	Salt. Miscellaneous stone. Fuller's earth, limestone, quicksilver.
1920			3,850	56,550	206	38			61,187	76,395	106,733			8,385	34,912,865	1,810,147	50,660,438	86,831,991	22,000 tons 3,060 tons	87,000 20,100 31,180	Salt. Silica. Miscellaneous stone.
1921			5,840	85,820					84,698	72,629	141,491			1,897	40,136,930	1,926,797	57,434,945	97,639,407	18,500 tons	108,270 93,500 38,208	Cement, gems, lead, quicksilver. Salt. Miscellaneous stone.
1922			5,082	86,652	[1]				124,337	[1]				6,524	47,644,633	2,282,100	53,512,157	64,803,222	18,000 tons	829,115 66,000 35,585	Cement, gypsum, limestone, silica. Salt. Miscellaneous stone.
1923			5,217	68,375					107,051	17,958	214,183			33,151	42,421,592	2,051,656	45,952,794	37,629,300	18,921 tons	1,166,582 97,336 9,225 1,602,138	Cement, copper, lime, silica, lead. Salt. Miscellaneous stone. Cement, clay (pottery), gypsum, limestone, pumice, sulphur.
1924			[1]						154,132	8,130	96,880			35,902	47,881,308	2,522,551	61,175,405	69,572,934	10,506 tons	44,115 23,058 5,244 1,709,635	Salt. Brick and clay (pottery). Miscellaneous stone. Arsenic, cement, copper, lead, pumice, sulphur.
1925			[1]						135,545					7,455	45,649,845	2,290,608	58,852,742	84,255,094	6,890 tons	28,858 3,000 2,680,166	Salt. Miscellaneous stone. Antimony, borates, cement, brick, clay (pottery).
1926			4,591	55,140					135,508					4,667	44,182,140	2,158,867	54,540,646	78,987,887	11,279 tons	41,116 28,000 2,144,889	Salt. Miscellaneous stone. Cement, feldspar, fuller's earth, gypsum, lime, pumice, silica.
1927			4,835	50,438	[1]				171,100	[1]				8,932	39,401,478	2,057,807	51,570,412	58,738,699	14,960 tons	69,839 79,510 3,553,163	Salt. Miscellaneous stone. Borates, cement, clay (oil well mud), copper, feldspar, gypsum, lime, onyx, pumice.
Totals	286,610	$3,327,858	94,926	$940,461	1,086,533	$199,744	[1]4,216	$74,531	$22,166,377	2,653,042	$2,758,912		$65,441	$1,530,037	466,490,362	$25,290,340	1,097,340,610	$967,735,996		$18,145,192	

[1]See under 'Unapportioned.'

LAKE COUNTY, 1873-1927.

Year	Quicksilver		Mineral water		Chromite		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
	Flasks	Value	Gallons	Value	Tons	Value		Amount	Value	Substance
1873	880	$70,790								
1874	1,695	178,280								
1875	8,821	743,287								
1876	14,199	624,756								
1877	18,100	675,130								
1878	14,428	474,681								
1879	15,582	309,303								
1880	17,148	531,588								
1881	17,393	518,833								
1882	10,193	287,748								
1883	6,481	186,329								
1884	4,182	127,551								
1885	4,765	146,524								
1886	3,498	124,179								
1887	4,307	182,509								
1888	6,636	282,030	*	*						
1889	4,713	212,085	*	*						
1890	4,232	222,180	*	*						
1891	4,975	225,119	*	*						
1892	11,140	453,509	*	*						
1893	9,731	357,614	*	*						
1894	12,471	382,954	*	*						
1895	12,856	465,074	87,500	$42,000						
1896	6,307	232,484	65,920	32,460						
1897	3,585	134,546	511,950	76,585						
1898	1,729	64,746	523,000	37,350						
1899	2,954	128,179	166,020	75,924						
1900	3,165	127,345	758,600	45,400						
1901	4,395	211,324	201,706	120,360						
1902	3,611	161,568	241,100	126,663						
1903	2,595	106,397	381,040	187,621						
1904	[2]2,854	109,719	659.000	221,000						
1905	1,462	51,937	489,000	219,500						
1906	1,066	38,909	365.000	160,000						
1907	802	30,604	304,340	130,936						
1908	1,300	54,951	246,545	118.300			$10.000			
1909	1,075	56,277	265,000	108,270					$28,423	Unapportioned, 1900-1909.
1910	1,048	47,422	212,546	95,005						
1911	899	41,363	227.440	58,933						
1912	209	8,786	202,000	114,500						
1913	395	15,891	209,750	109,938						
1914	331	16,236	254,150	47,267						
1915	492	41,660	165,130	24,371			5,000		1,503	Copper, gold, silver.
1916	1 139	106,496	195,650	54,160	871	$15,070	4,500		770	Other minerals.
1917	1,067	107,071	129,157	22,685	1,466	36,326	2,500	85 tons	1,900	Manganese.
									70	Other minerals.
1918	1,540	172,173	87,067	15,006	476	24,790	1,000		2,907	Manganese and natural gas.
1919	229	20,604	62,839	17,471	[3]		1,200		100	Other minerals.
1920	385	24,314	43,693	16,413	84	1,560	13,200	247 tons	7,816	Manganese.
									250	Other minerals.
1921	22	880	54,715	26 751			146,508		250	Other minerals.
1922	38	2,000	60,420	29,370			16,669		250	Other minerals.
1923	17	1,050	63,730	44,738			55,000		250	Other minerals.
1924	[3]		66,420	59,423			22,833		14,140	Natural gas and quicksilver
1925			62,970	57,793			15,300		255	Copper and natural gas.
1926	86	7,778	57,000	58,235			[3]		9,680	Natural gas and miscellaneous stone.
1927	245	29,234	45,643	51,149			4,445	440 M cu. ft.	220	Natural gas.
Totals	253,468	$9,933,997	7,466,041	$2,605,577	[3]2,897	77,746	$298,155		$68,784	

* Bartlett since 1888 and Witter since 1889 reported to U. S. Geological Survey, but no segregated figures available for Lake County previous to 1895.

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.

[2] Flasks of 75 pounds, beginning June 1, 1904. Previously 76½ pounds.

[3] See under 'Unapportioned.'

LAKE COUNTY, 1873-1927.

Year	Quicksilver		Mineral water		Chromite		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
	Flasks	Value	Gallons	Value	Tons	Value		Amount	Value	Substance
1873	880	$70,790								
1874	1,695	178,280								
1875	8,821	743,287								
1876	14,199	624,756								
1877	18,100	675,130								
1878	14,428	474,681								
1879	15,582	309,303								
1880	17,148	531,588								
1881	17,393	518,833								
1882	10,193	287,748								
1883	6,481	186,329								
1884	4.182	127,551								
1885	4,765	146,524								
1886	3,498	124,179								
1887	4,307	182,509								
1888	6,636	282,030	*	*						
1889	4,713	212,085	*	*						
1890	4,232	222,180	*	*						
1891	4,975	225,119	*	*						
1892	11,140	453,509	*	*						
1893	9,731	357,614	*	*						
1894	12,471	382,954	*	*						
1895	12,856	465,074	87,500	$42,000						
1896	6,307	232,484	65,920	32,460						
1897	3,585	134,546	511,950	76,585						
1898	1,729	64,746	523,000	37,350						
1899	2,954	128,179	166,020	75,924						
1900	3,165	127,345	758,600	45,400						
1901	4,395	211,324	201,706	120,360						
1902	3,611	161,568	241,100	126,663						
1903	2,595	106,397	381,040	187,621						
1904	[2]2,854	109,719	659,000	221,000						
1905	1,462	51,937	489,000	219,500						
1906	1,066	38,909	365,000	160,000						
1907	802	30,604	304,340	130,936						
1908	1,300	54,951	246,545	118,300			$10,000			
1909	1,075	56,277	265,000	108,270					$28,423	Unapportioned, 1900-1909.
1910	1,048	47,422	212,546	95,005						
1911	899	41,363	227,440	58,933						
1912	209	8,786	202,000	114,500						
1913	395	15,891	209,750	109,938						
1914	331	16,236	254,150	47,267						
1915	492	41,660	165,130	24,371			5,000		1,503	Copper, gold, silver.
1916	1 139	106,496	195,650	54,160	871	$15,070	4,500		770	Other minerals.
1917	1,067	107,071	129,157	22,685	1,466	36,326	2,500	85 tons	1,900	Manganese.
									70	Other minerals.
1918	1,540	172,173	87,067	15,006	476	24,790	1,000		2,907	Manganese and natural gas.
1919	229	20,604	62,839	17,471	[3]		1,200		100	Other minerals.
1920	385	24,314	43,693	16,413	84	1,560	13,200	247 tons	7,816	Manganese.
									250	Other minerals.
1921	22	880	54,715	26 751			146,508		250	Other minerals.
1922	38	2,000	60,420	29,370			16,669		250	Other minerals.
1923	17	1,050	63,730	44,738			55,000		250	Other minerals.
1924	[3]		66,420	59,423			22,833		14,140	Natural gas and quicksilver
1925			62,970	57,793			15,300		255	Copper and natural gas.
1926	86	7,778	57,000	58,235			[3]		9,680	Natural gas and miscellaneous stone.
1927	245	29,234	45,643	51,149			4,445	440 M cu. ft.	220	Natural gas.
Totals	253,468	$9,933,997	7,466,041	$2,605,577	[2]2,897	77,746	$298,155		$68,784	

* Bartlett since 1888 and Witter since 1889 reported to U. S. Geological Survey, but no segregated figures available for Lake County previous to 1895.

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.

[2] Flasks of 75 pounds, beginning June 1, 1904. Previously 76½ pounds.

[3] See under 'Unapportioned.'

LAKE COUNTY, 1873-1927—Continued.

In addition to the above, Lake County has produced the following:

Borax	Sulphur	Pounds	Value
1864 to 1868 Borax Lake yielded 590 tons refined borax, worth $414,636; 1872 from Lake Hachinhama, 140 tons, worth $89,600; total 730 tons, worth $504,236	1865	214,650	$8,030
	1866	675,963	21,970
	1867	487,603	13,420
	1868	503,481	10,080
	Totals	1,881,697	$53,500

Year	Gold, value	Silver, value	Petroleum		Asphalt (tons)	Natural gas (M cu. ft.)	Gypsum		Salt		Gems, value	Mineral water		Brick		Pottery clay		Sandstone and serpentine		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
			Barrels	Value	Amount	Value	Tons	Value	Tons	Value		Gallons	Value	M	Value	Tons	Value	Cubic feet	Value		Amount	Value	Substance
1880	$7,700	$66,300	*																				
1881	13,000	39,000																					
1882	17,000	24,000																					
1883	20,000	25,000																					
1884	40,000	11,000																					
1885	22,500	1,945																					
1886	21,500	6,750																					
1887	25,000	25,000																					
1888	20,000	10,000																					
1889	38,203	97																					
1890	74,320	7,266																					
1891	40,759																						
1892	219,304																						
1893	14,200													7,500	$37,500					$5,500	9,500 bbls.	$10,800	Lime.
1894	34,500		475,650	$617,065			1,134	$11,340						45,800	235,000					47,500			
1895	23,330		979,695	732,817			3,790	37,820						27,478	179,290			[2]1,500	$6,000	30,000			
1896	35,468		953,734	812,800			960	9,180						36,868	228,290			[2]2,500	2,500	30,625	5 tons	200	Infusorial earth.
1897	40,698		1,327,011	1,327,011			1,900	17,250										10,500	5,250	32,500	2 tons	50	Sulphur.
1898	21,300		1,462,871	1,462,871			2,500	18,500						25,908	188,386	50	$500	750	3,000				
1899	13,132		1,409,356	1,409,356	[3]1,151	$23,020	3,563	14,250				193,500	$5,805	23,385	147,400			[4]6,000	3,000	112,001	1,600 cu. ft.	2,000	Marble.
1900	5,508		1,722,887	1,722,887	[3]5,000	100,000	2,500	10,000						55,725	275,925	4,576	10,776	[4]7,500	3,750	24,352			
1901	10,312		2,304,432	1,062,038	[3]10,000	[3]1,500 152,838	3,500	35,500	6,650	$19,950				44,435	264,825	130	390	[4]350 [4]89	2,000 90	94,229	10 tons	19	Soapstone.
1902	7,209		2,198,496	1,075,868	[3]16,767	171,904			90	180				52,776	335,670	890	890			105,047	100 tons	300	Mineral paint.
																					14,400 lbs.	504	Lead.
																					60 tons	360	Infusorial earth.
1903	8,674	22	1,960,604	1,294,866	[3]28,306	332,600	5,914	38,441	8,000	20,000		95,000	5,500	79,195	706,334	115	115	[4]2,163	9,734	118,185	1,736 tons	2,558	Glass sand.
																					219 tons	10,124	Soapstone.
																					10,000 bbls.	10,000	Lime.
1904	12,402	73	2,190,000	1,289,910	[3]30,425	307,068			7,560	24,480		125,750	7,084	128,719	767,827	5,000	5,000	[4]29,211	13,145	83,826	709 tons	4,254	Glass sand.
																		[4]200	2,310		228 tons	2,315	Soapstone.
1905	15,035	100	2,854,564	1,056,188	[3]23,718	119,430	11,500	43,500	12,000	20,000		175,000	31,250	109,563	853,810	30,533	16,066	[4]3,784	9,950	69,021			
1906			2,814,000	908,800	[3]25,920	259,200	21,000	69,000	12,000	36,000		85,465	5,128	127,965	826,831	41,350	34,350	[4]19,080	9,540	176,558	18,000 bbls.	18,000	Lime.
																		[4]847	1,694		50 tons	200	Infusorial earth.
																					849 lbs.	169	Copper.
1907			4,318,739	2,633,541	[3]26,610	353,423	7,500	50,000	12,000	36,000		385,000	35,100	101,079	895,272	17,500	20,500	[4]21,196	19,076	36,904	1,000 cu. ft.	3,000	Marble.
																		[4]1,000	3,000		25,000 bbls.	25,000	Lime.
1908			6,244 347	4,082,052	[3]25,000	250,000	12,000	75,000	12,000	48,000	$8,500	573,975	42,857	108,414	800,163	25,934	55,274	[4]6,292	2,000	598,618	200 tons	8,000	Glass sand.
																					1,800 tons	14,400	Glass sand.
1909	864	2	5,409,392	3,513,192	[3]40,740	616,500	10,000	50,000	10,000	30,000	9,500	266,315	19,988	136,202	1,195,892	14,027	26,988			182,377	2,000 cu. ft.	6,000	Marble.
																						842,530	Unapportioned, 1900-1909.
																					40 tons	320	Infusorial earth.
1910			5,127,266	3,185,433	[3]45,872 [3]30,920	591,193 15,208			6,000	12,000	4,900	319,491	23,999	148,723	1,361,653	450	800			324,091	60 tons	720	Feldspar.
																					80 tons	200	Glass sand.
																					1,600 cu. ft.	4,800	Marble.
1911	[5]		4,924,288	3,313,972		[3]15,208			7,592	16,113	5,000	229,019	17,256	160,259	1,442,913	15,650	41,025			553,076	1,100 cu. ft.	3,300	Marble.
1912	[5]		4,484,590	2,798,384		[3]78,672			10,360	46,370	3,000	76,495	6,333	174,862	1,692,258	11,929	12,028			955,668	1,800 tons	1,800	Glass sand.
																					1,800 tons	2,000	Glass sand.
1913	2,322	27	4,143,690	2,672,680	[3]1,287,794	77,578			10,000	40,000	2,500	255,095	15,140	204,912	1,752,106	7,425	20,135			1,008,810		240,000	Other minerals.
																					13,203 tons	349,669	Borax.
1914			3,558,690	1,957,279	[3]1,250,000	75,000			20,000	60,000	2,100	331,151	8,025	133,557	1,244,971	8,263	14,566			953,434	10 tons	460	Potash.
																						330,020	Barite, borax, potash.
1915			2,931,098	1,843,661	[3]1,729,035	120,783					700	350,171	29,491	88,669	820,312	6,507	1,511			1,022,134			
																					1,864 tons	324,769	Potash.
1916			2,875,468	1,871,930	[3]2,083,664	139,522			[6]	[6]	600	320,700	8,552	82,005	760,912	6,233	10,549			971,153	612 tons	1,684	Silica.
																						373,374	Borax, copper, graphite, salt.
																					1,710 tons	400,902	Potash.
1917			4,669,583	5,491,430	[3]1,670,476	194,793			[6]	[6]	300	188,368	16,902	and tile	939,081	6,276	10,321	[6]	[6]	608,026		542,768	Borax, graphite, magnesium chloride, salt silica, serpentine, talc.
																					18,630 tons	121,903	Building tile.
1918			10,125,190	13,567,755	[3]2,088,959	224,279			[6]	[6]	[6]	110,481	15,540	43,381	668,676	12,634	11,320	[6]	[6]	547,190	2,380 tons	462,600	Potash.
																						386,865	Borax, gems, graphite, magnesium chloride, manganese, salt, serpentine.
1919			15,076,633	20,805,754	[3]4,148,476	458,812			[6]	[6]	[6]	125,400	8,787	and tile	1,185,154	11,329	33,343			715,524		399,007	Borax, gems, graphite, magnesium salts, manganese, salt.
																					27,954 tons	308,476	Building tile.
1920		[5]	14,026,536	21,488,653	[3]6,225,835	656,465			6,502	6,577		161,466	10,371	127,854	2,333,941	18,684	91,763			1,704,951		473,966	Borax, copper, gold, graphite, infusorial earth, lead, magnesium salts, silver.
1921		[5]	12,395,605	25,795,254	[3]6,944,277	638,936			[6]	[6]	[6]	264,468	13,314	and tile	3,208,448	29,055	62,856			1,763,180		222,943	Borax, gems, gold, graphite, limestone, magnesium chloride, salt, silver.
																					39,095 tons	397,136	Building tile.
1922		[5]	37,726,367	52,930,093	[3]23,254,549	1,653,571			[6]	[6]		300,400	15,450	240,424	4,190,485	54,924	66,519			3,390,477	12,096 tons	35,168	Limestone.
																						72,772	Borates, gold, graphite, magnesium salts, salt, silver.
																						40,000	Building stone.
1923	714	6	158,665,019	154,063,733	[3]134,799,452	8,760,961			[6]	[6]		440,563	24,787	310,897	5,307,968	128,825	59,272			5,408,808	53,199 tons	522,890	Building tile.
																					2,717 tons	8,779	Limestone marl.
																						169,541	Borates, diatomaceous earth, magnesium chloride, salt, silica, soapstone.
																					46,941 tons	454,728	Building tile (hollow).
1924	751	5,515	119,027,428	147,474,953	[3]122,838,521	9,191,395			[6]	[6]		1,889,285	88,942	301,957	5,030,259	84,065	132,855			5,923,329		117,982	Copper, building stone (tuff), diatomaceous earth, lead, limestone, magnesium chloride, salt.
																						426,178	Building tile (hollow).
1925	409	15,444	121,214,551	173,215,593	[3]98,226,700	8,704,894						3,811,270	336,038	196,955	3,300,748	217,707	106,817			6,978,605	44,345 tons	95,274	Copper, lead, limestone, magnesium chloride, salt, sandstone, zinc.
																					21,471 tons	192,408	Building tile (hollow).
1926	94	42,658	105,826,337	174,084,324	[3]91,054,793	8,965 307			[6]	[6]		4,026,465	200,459	238,326	2,951,067	86,767	99,076			7,472,884	1,104,507 lbs.	88,361	Lead.
																					2,564,188 lbs.	192,314	Zinc.
																						66,974	Building stone (tuff), limestone (marl), salt.
1927	2,345	14,819	103,625,615	114,583,011	59,749,559	7,117,081			[6]	[6]		3,934,525	260,198	214,332	2,714,398	147,621	206,175			6,292,078	28,950 tons	288,471	Building tile (hollow).
																					312,645 lbs.	19,697	Lead.
																						334,168	Copper, graphite, diatomaceous earth limestone, magnesite, salt, titanium, zinc.
Totals	[3]$808,453	[3]$295,018	769,049,732	$946,145,154		$50,167,141	87,761	$479,781	[3]$140,754	$406,670	[3]$45,200	14,402,508	$1,252,296		$48,846,675	$994,449	1,151,890		$99,039	$48,340,916		$9,436,170	

*Commercial production of petroleum in Los Angeles began at least as early as 1874, in the Newhall district, but detailed county segregations are not available for the early years.

[1] Includes granite, crushed rock, rubble, paving blocks, sand, gravel.

[2] Asphalt, tons.

[3] Natural gas, thousand cubic feet.

[4] Included in Riverside County production.

[5] Included in Monterey County production.

[6] Sandstone.

[7] Serpentine.

[8] See under "Unapportioned."

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LASSEN COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Miscellaneous stone, value	Miscellaneous and unapportioned		
				Amount	Value	Substance
1880	$25,900					
1881	71,000	$1,000				
1882	100,000	20,000				
1883	20,000	5,000				
1884	[1]119,060	341				
1885	15,000	150				
1886	25,812	135				
1887	24,108	301				
1888	50,000	200				
1889	97,503	215				
1890	14,890	300				
1891	3,676					
1892	15,400					
1893						
1894	35,283					
1895	25,000					
1896	40,300					
1897	49,100	850				
1898	37,460	300				
1899	28,898					
1900	19,807	676				
1901	5,900	200				
1902	23,410	214				
1903	91,102	1,203				
1904	116,993	1,515				
1905						
1906	[2]	[2]				
1907	[2]	[2]				
1908	7,284	783				
1909	[3]116,327	[3]1,463			$217,521	Unapportioned, 1900-1909.
1910	[4]82,180	[4]972				
1911	[2]	[2]			1,522	Gold and silver.
1912						
1913		2	$2,030			[5]
1914	1,250	4	775			[5]
1915			870			
1916			9,725			
1917			376			
1918			800			
1919			1,100			
1920			7,313		5,000	Other minerals.
1921	39,943	1,234	42,308			
1922	[2]	[2]	9,540		17,877	Brick, gold and silver.
1923	[2]	[2]	7,600		240	Gold and silver.
1924	2,250	44	35,614			
1925	1,130	24	1,250			
1926	67	1	18,995			
1927	531	9	47,885		1,000	Granite curbing.
Totals	$1,307,564	$37,169	$186,181		$243,160	

[1]Lawver, A. M., in 'Production of Precious Metals in U. S.': Report of Director of Mint, 1884, p. 175, 1885.
[2]See under 'Unapportioned.'
[3]Includes Modoc and Colusa Counties' production.
[4]Includes Colusa county production.
[5]Copper production erroneously reported from Lassen County in the years 1913 and 1914, on account of shipping point being Doyle, while producing copper mines were located in Plumas County.

LASSEN COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Miscellaneous stone, value	Miscellaneous and unapportioned		
				Amount	Value	Substance
1880	$25,900					
1881	71,000	$1,000				
1882	100,000	20,000				
1883	20,000	5,000				
1884	[1]119,060	341				
1885	15,000	150				
1886	25,812	135				
1887	24,108	304				
1888	50,000	200				
1889	97,503	215				
1890	14,890	300				
1891	3,676					
1892	15,400					
1893						
1894	35,283					
1895	25,000					
1896	40,300					
1897	49,100	850				
1898	37,460	300				
1899	28,898					
1900	19,807	676				
1901	5,900	200				
1902	23,410	244				
1903	91,102	1,203				
1904	116,993	1,515				
1905						
1906	[2]	[2]				
1907	[2]	[2]				
1908	7,284	783				
1909	[3]116,327	[3]1,463			$217,521	Unapportioned, 1900-1909.
1910	[4]82,180	[4]972				
1911	[2]	[2]			1,522	Gold and silver.
1912						
1913		2	$2,030			[5]
1914	1,250	4	775			[5]
1915			870			
1916			9,725			
1917			376			
1918			800			
1919			1,100			
1920			7,313		5,000	Other minerals.
1921	39,943	1,234	42,308			
1922	[2]	[2]	9,540		17,877	Brick, gold and silver.
1923	[2]	[2]	7,600		240	Gold and silver.
1924	2,250	44	35,614			
1925	1,130	24	1,250			
1926	67	1	18,995			
1927	531	9	47,885		1,000	Granite curbing.
Totals	$1,307,564	$37,169	$186,181		$243,160	

[1]Lawver, A. M., in 'Production of Precious Metals in U. S.': Report of Director of Mint, 1884, p. 175, 1885.
[2]See under 'Unapportioned.'
[3]Includes Modoc and Colusa Counties' production.
[4]Includes Colusa county production.
[5]Copper production erroneously reported from Lassen County in the years 1913 and 1914, on account of shipping point being Doyle, while producing copper mines were located in Plumas County.

Year	Gold, value	Silver, value	Copper		Brick	
			Pounds	Value	M	Value
1893	[1]$150,696	$314				
1894	107,791	180				
1895	162,323					
1896	104,339	1,240				
1897	85,963					
1898	94,884	50			400	$2,800
1899	73,758	292			439	3,070
1900	104,134	3,833	500,000	$77,500	500	3,000
1901	82,749	2,600	108,430	17,077	500	3,000
1902	35,128	3	18,600	2,139	230	1,840
1903	93,070	3	36,000	4,680	216	972
1904	75,303	25	10,300	1,313	750	3,750
1905	50,867	10,014				
1906	22,390	508				
1907	13,303	506	1,895	379	1,250	12,500
1908	45,107	1,264	113,293	15,454	250	2,250
1909	14,716	403	5,000	635		
1910	10,076	850	336,667	42,876	740	3,700
1911	1,958	77	14,608	1,826	270	1,350
1912	9,162	1,162	248,129	40,941	300	1,500
1913	14,489	1,617	532,403	82,522	315	1,650
1914	4,506	36	35,359	4,703		
1915	11,214	2,126	40,294	7,051	200	1,400
1916	10,306	1,772	124,286	30,574		
1917	18,914	489	372,123	101,590		
1918	7,583	4,206	245,519	60,643		
1919	17,705	1,700	175,405	32,625		
1920	6,382	1,488	89,846	16,532		
1921	1,053	27				
1922	1,594	3,500				
1923	12,074	541				
1924	3,208	176	34,467	4,515		
1925	2,366	82				
1926	1,708	22				
1927	4,181	38				
Totals	$1,455,000	$42,144	3,042,624	$545,575	6,360	$42,782

[1] Madera County created March 11, 1893, from a portion of Fresno County. Between 80 per cent and 90 per cent of the gold and silver produced in Fresno County prior to 1893 was from that part now in Madera County.

[2] Includes crushed rock, rubble, rip-rap, sand, gravel.

[3] See under 'Unapportioned.'

COUNTY, 1893-1927.

Granite		Miscellaneous stone[2], value	Miscellaneous and unapportioned		
Cubic feet	Value		Amount	Value	Substance
48,858	$31,494				
39,590	49,662				
48,628	73,525	$7,800			
39,030	37,215	1,249			
23,103	49,673	500			
47,433	36,000	2,500			
124,015	80,000			$65,000	Unapportioned, 1900-1909.
96,716	291,799	600			
165,845	78,041	4,000			
128,581	389,800	1,000			
113,627	98,083	500			
42,316	123,106				
65,472	176,416				
99,278	93,372				
140,086	123,668	2,140	2,279 lbs.	84	Lead.
142,622	111,380	5,836			
99,192	74,152	1,112			
99,900	74,190	800			
82,135	56,058	3,213	5,533 lbs.	249	Lead.
150,994	270,123	1,466			
	186,543	6,221	50 tons	1,000	Pumice.
	84,632	37,640		1,000	Other minerals.
128,865	172,191	7,915			
	114,400	1,525	221 lbs.	19	Lead.
	40,355	1,540			
	64,358	1,500			
	98,523				
	461,822	4,765			
	454,222	16,948			
	486,670			18,750	Other minerals.
	935,820	11,750			
	1,358,410	16,600			
	418,683	5,325			
	[3]	[3]		1,055,447	Granite paving blocks and miscellaneous stone.
	$7,197,386	$144,445		$1,141,549	

MARIN

Year	Brick		Miscellaneous stone[1]	
	M	Value	Tons	Value
1888	1,600	$10,000		
1889	*2,000	12,000		
1890	*5,000	30,000		
1891	*10,000	60,000		
1892	*12,000	72,000		
1893	18,000	108,000		
1894	28,500	172,500		$16,850
1895	29,000	145,000		7,790
1896	15,000	85,000	7,849	8,260
1897	15,000	89,000	6,000	7,200
1898	15,500	66,000	1,710	1,800
1899	16,500	76,000	4,400	5,150
1900	25,000	200,000	3,000	2,500
1901	14,320	100,240	34,000	27,987
1902	14,600	97,700	149,450	105,350
1903	13,819	78,095	144,715	140,332
1904	20,500	132,000	216,576	170,995
1905	22,877	163,585	113,000	44,250
1906	23,900	199,300	54,000	53,000
1907	16,000	118,000	157,100	134,111
1908	10,000	50,000	111,686	66,700
1909	4,500	105,000	132,010	67,010
1910	22,497	99,185	112,000	74,700
1911	19,695	87,445	173,646	108,786
1912	18,000	88,200	5,300	3,000
1913	16,000	70,500	428,357	198,953
1914	15,000	55,000		490,137
1915	10,000	50,000		101,528
1916	[2]			74,000
1917	[2]			158,582
1918	[2]			89,458
1919	[2]			127,111
1920	[2]			208,302
1921	[2]			202,333
1922	[2]		[2]	[2]
1923	[2]			516,936
1924	[2]			356,035
1925	[2]			214,602
1926	[2]			413,712
1927	[2]			381,256
Totals	[2]434,808	$2,619,750		$4,608,716

*Estimated.
[1]Includes crushed rock, rubble, rip-rap, sand, gravel
[2]See under 'Unapportioned.'

COUNTY, 1888-1927.

Mineral water		Miscellaneous and unapportioned		
Gallons	Value	Amount	Value	Substance
		7,000 cu. ft	$5,000	Granite
		700 tons	1,400	Salt.
		150 tons	300	Salt.
52,000	$12,050			
47,500	5,075		42,000	Unapportioned, 1900-1909.
100,000	10,000			
328,740	36,500			
260,000	31,000			
60,000	9,000			
60,000	9,000			
60,000	9,000			
[2]			74,000	Brick and mineral water.
[2]			113,720	Brick and mineral water.
[2]			86,725	Brick, copper, gold, mineral water, silver.
[2]			101,863	Brick and mineral water.
[2]			127,443	Brick and mineral water.
[2]			116,443	Brick and mineral water.
[2]	[2]		403,099	Brick, mineral water, potash, miscellaneous stone.
			171,945	Brick, clay, mineral water.
			171,196	Brick, pottery clay, mineral water.
[2]			190,200	Brick, clay and mineral water.
[2]			113,841	Brick and mineral water.
[2]			145,748	Brick and mineral water.
[3]962,240	$121,625		$1,864,923	

MARIPOSA COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Copper		Miscellaneous and unapportioned		
			Pounds	Value	Amount	Value	Substance
1880	$150,017	$1,300					
1881	200,000	1,200					
1882	250,000	4,000					
1883	220,000	3,000					
1884	180,000						
1885	149,177	100					
1886	197,600						
1887	187,165	96					
1888	175,000	250					
1889	145,819	210					
1890	124,265	22					
1891	84,414						
1892	81,011	67					
1893	164,116	307					
1894	153,708	39					
1895	216,622	7					
1896	335,637	180					
1897	451,427	660					
1898	336,418	993					
1899	562,829	2,207			110 sq'r's	$600	Slate.
1900	157,663	13,853					
1901	504,928	4,787	191,622	$30,180	70,000 lbs.	3,080	Lead.
1902	631,478	3,880	104,700	11,940			
1903	542,355	3,353	61,627	6,808			
1904	429,771	2,839	11,500	1,466			
1905	386,380	5,231	12,541	1,956		25	Platinum.
1906	366,394	3,377					
1907	405,498	4,500			1,142 lbs.	60	Lead.
1908	439,862	4,732	29,124	2,958		36,560	Miscellaneous stone.
1909	396,465	2,729				62,430	Miscellaneous stone.
						8,431	Unapportioned, 1900-1909.
1910	317,580	2,364				21,501	Miscellaneous stone.
					800 tons	4,800	Barytes.
1911	172,532	1,390	14,641	1,830			
1912	160,541	6,796	284,587	46,957			
1913	171,034	7,430	416,031	64,485		3,130	Other minerals.
						15,366	Miscellaneous stone.
1914	131,458	677	277,472	36,904	2,000 tons	3,000	Barytes.
					100 cu. ft.	100	Marble.
1915	385,577	2,175	38,630	6,760		17,214	Miscellaneous stone.
						600	Other minerals.
1916	401,718	2,680	162,318	39,930	1,857 lbs.	128	Lead.
						4,143	Other minerals.
						39,372	Miscellaneous stone.
1917	313,296	3,221	53,381	14,583	1,075 lbs.	92	Lead.
						13,399	Other minerals.
						7,646	Miscellaneous stone.
1918	337,682	5,083	30,294	7,483		1,856	Chromite and lead.
						400	Miscellaneous stone.
1919	253,392	4,139	24,879	4,627		8	Other minerals.
						400	Miscellaneous stone.
1920	261,830	4,705	[1]			4,096	Barytes, copper, lead.
						400	Miscellaneous stone.
1921	331,295	5,251				5,655	Barytes and pyrites.
						400	Miscellaneous stone.
1922	218,571	3,301				4,960	Barytes, pyrites and miscellaneous stone.
1923	141,883	1,735				27,293	Barytes, pyrites and miscellaneous stone.
1924	182,099	1,608				3,000	Other minerals.
						48,000	Miscellaneous stone.
1925	192,810	1,758				3,500	Other minerals.
						436,794	Miscellaneous stone.
1926	182,313	1,518				130,804	Miscellaneous stone.
						5,089	Barytes, copper and pyrites.
						2,000	Granite.
1927	183,805	1,376				259,677	Miscellaneous stone.
						53,020	Barites, pyrite, slate.
Totals	$12,965,435	$121,126	[1]1,713,347	$278,867		$1,229,029	

[1]See under 'Unapportioned.'

Year	Brick		Manganese ore	
	M	Value	Tons	Value
1880				
1881				
1882				
1895				
1896				
1898	258	$1,080		
1899	200	1,800		
1900	25	400		
1901	200	2,500		
1902	200	2,000		
1903	550	5,580		
1904	260	3,120		
1905	635	6,470		
1906	500	5,000		
1907	400	4,000		
1908	260	2,600		
1909	150	1,500		
1910				
1911	160	1,600		
1912				
1913				
1914				
1915			2,858	$23,036
1916			1,735	43,005
1917	[2]		1,541	40,515
1918			1,432	58,962
1919				
1920			[2]	
1921	[2]		[2]	
1922	[2]			
1923				
1924	550	7,125		
1925	[2]			
1926				
1927	[2]			
Totals	[2]4,348	$44,775	[2]7,566	$165,518

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]See under 'Unapportioned.'

COUNTY, 1880-1927.

Mineral water		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Gallons	Value		Amount	Value	Substance
				$733	Gold.
				125	Silver.
				1,000	Gold.
			50 tons	150	Coal.
			450 tons	2,250	Bituminous rock.
17,470	$6,988				
24,875	8,048				
27,950	8,220				
28,575	7,898				
38,900	15,000				
40,000	12,000			75	Gold.
90,000	18,000			40	Gold.
40,000	9,800			19	Gold.
45,000	9,800				
45,000	9,800				
45,000	9,000	$1,200		18,000	Unapportioned, 1900-1909.
		500			
		300			
		9,450			
		560			
		1,500			
		8,275	300 tons	2,400	Magnesite.
				2,000	Other minerals.
		5,600		4,300	Brick, chromite, magnesite.
		5,000		226	Gold, platinum.
			555 tons	44,200	Chromite.
		7,000		7,214	Chromite, platinum.
		7,500		18,610	Chromite, manganese, natural gas, platinum
		40,000		1,509	Gold.
				13	Silver.
				3,200	Brick, manganese, natural gas, platinum.
		18,762		1,800	Brick, natural gas, platinum.
		48,350		5,050	Coal, natural gas.
		49,680		3,963	Coal, natural gas, platinum, manganese.
		11,603		4,930	Brick, coal, natural gas.
		15,750		50	Other minerals.
		44,630		3,040	Brick and natural gas.
442,770	$114,554	$275,670		$124,897	

MERCED COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Copper		Brick		Miscellaneous and unapportioned		
			Pounds	Value	M	Value	Amount	Value	Substance
1880	$17,515								
1881	1,500								
1882	10,000								
1883	10,000								
1884	6,500								
1885	10,000								
1886	7,000								
1887	10,767	$5							
1888	10,000								
1889	4,843								
1890	2,000	59							
1891	1,728	17							
1892	445								
1893									
1894	763								
1895	1,500								
1896	1,250								
1897									
1898									
1899									
1900	[1]								
1901	[1]		79,071	$12,453					
1902			14,400	1,656					
1903	[1]		6,000	780					
1904	[1]		8,900	1,135					
1905	[1]				600	$3,500			
1906					650	6,000			
1907	822	10			1,250	12,500			
1908	[2]182,970	[2]1,196	694	70	700	6,300	965 lbs.	$36	Lead.
1909	[2]228,492	[2]572			700	6,300		18,264	Unapportioned.
1910	[1]	[1]			700	6,300		64,764	Miscellaneous stone.
1911	[1]	[1]						49,548	Miscellaneous stone.
1912	[1]	[1]						45,000	Miscellaneous stone.
1913	[4]2,255	[4]92	19,240	2,982				30,000	Miscellaneous stone.
1914	[2]111,361	[2]340							
1915	[3]	[3]					690 lbs.	32	Lead.
								94,000	Other minerals.
1916	[3]	[3]					90 tons	720	Magnesite.
								80,810	Gold, platinum, silver.
1917	[3]	[3]						70,500	Miscellaneous stone.
								76,616	Gold, platinum, silver.
1918	41,089	254						32,500	Miscellaneous stone.
								1,006	Other minerals.
1919	[1]	[1]						40,350	Miscellaneous stone.
1920								24,800	Miscellaneous stone.
1921	3,163	87						30,300	Miscellaneous stone.
1922	[3]	[3]			[3]			88,110	Miscellaneous stone.
								69,469	Building tile, gold and silver.
1923	[3]	[3]			[3]			134,036	Miscellaneous stone.
								101,567	Brick, building tile, gold and silver.
1924	355	1	[3]		[3]			14,262	Miscellaneous stone.
								72,933	Clay and clay products.
								52	Copper and lead.
1925	289	1			[3]			36,646	Miscellaneous stone
								43,326	Clay and clay products.
1926					[3]			156,486	Miscellaneous stone.
								36,179	Clay and clay products.
1927					[3]			189,537	Miscellaneous stone.
								177,336	Brick, hollow building tile, cement, clay (pottery).
Totals	$666,607	$2,634	128,305	$19,076	4,600	$40,900		$1,779,185	

[1]Included with Stanislaus County production.
[2]Includes Stanislaus County production.
[3]See under 'Unapportioned.'
[4]Dredge output included under Stanislaus County.

MODOC COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Salt		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
			Tons	Value		Amount	Value	Substance
1880	$10,000							
1881	20,000	$1,500						
1882								
1883	50,000							
1884	60,000							
1885	60,000							
1886								
1909	[2]							
1910	5,438	75						
1911	19,875	363						
1912	27,893	494	50	$800				
1913	6,061	94	40	720				
1914	1,000	10	40	720				
1915	7,557	104	[2]		$300		$720	Other minerals.
1916	2,729	90	[2]		200		540	Other minerals.
1917					200			
1918	[2]	[2]	[2]		200		8,020	Gold, salt, silver.
1919	6,478	390	[2]		550		1,802	Other minerals.
1920	[2]	[2]	[2]		700		3,968	Gem material (Iceland Spar) gold, salt, silver.
1921			[2]		34,930		1,720	Gem material (Iceland Spar) and salt.
1922			[2]		[2]		16,018	Salt, miscellaneous stone.
1923	[2]	[2]	[2]		8,109		288	Gold, silver.
1924			[2]		[2]		1,300	Salt, miscellaneous stone.
1925							2,400	Salt, miscellaneous stone.
1926	158	3			36,450		1,380	Other minerals.
1927					61,651		600	Other minerals.
Totals	$277,189	$3,123	[3]130	$2,240	$143,290		$38,756	

[1]Includes crushed rock, rubble, sand, gravel.
[2]Included under Lassen County production.
[3]See under 'Unapportioned.'

MONO COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Lead		Lime		Miscellaneous and unapportioned		
			Pounds	Value	Barrels	Value	Amount	Value	Substance
1880	$2,407,236	$582,905							
1881	3,385,000	300,000							
1882	2,200,000	380,000							
1883	1,750,000	290,000							
1884	1,000,000	285,000							
1885	482,860	91,849							
1886	439,558	163,502							
1887	382,498	118,945							
1888	297,000	75,000							
1889	193,264	86,827							
1890	144,180	52,293							
1891	302,415	18,983							
1892	396,296	271,058							
1893	293,637	11,401							
1894	358,824	11,549	50,000	$1,500					
1895	552,690	84,910	94,400	2,926			800 cu. ft.	$8,000	Onyx.
1896	451,553	82,283	73,500	2,205	500	$2,000	3,000 cu. ft.	24,000	Onyx.
1897	520,101	72,491	32,000	1,088	1,200	4,800			
1898	446,017	66,667	75,000	2,737	3,000	4,000			
1899	697,069	47,547	28,000	1,190	1,200	3,750			
1900	670,200	75,921	50,000	2,000	1,100	4,000			
1901	493,355	25,091	29,000	1,160	2,000	*3,000	1,938 lbs.	305	Copper.
1902	510,596	36,548	4,400	154	2,000	2,000			
1903	334,713	20,067	1,000	36	1,818	5,000	1,600 lbs.	208	Copper.
1904	268,930	2,955			215	850			
1905	308,884	11,240							
1906	338,698	13,151							
1907	383,971	29,797							
1908	413,946	26,134					7,100 gals.	5,575	Mineral water.
1909	354,909	37,792						106,772	Unapportioned, 1900-1909.
1910	435,724	9,391							
1911	261,232	35,508	37,000	1,665					
1912	377,518	70,602	23,936	1,077	4,961	3,721	8,179 lbs.	1,350	Copper.
1913	147,271	23,263			2,135	1,600	79,319 lbs.	12,294	Copper.
1914	7,000	10,000					1,000 lbs.	150	Salt.
1915	107,302	1,923						200	Other minerals.
1916	237,084	3,606						300	Other minerals.
1917	209,040	5,662	1,912	164				3,906	Copper, molybdenum. salt.
1918	31,252	22,727	1,318	94			160 lbs.	40	Copper.
								750	Other minerals.
1919	29,428	55,558	1,556	82			539 lbs.	100	Copper.
							3,215 lbs.	592	Copper.
1920	144,746	34,369	85,014	6,801				1,000	Miscellaneous stone.
								750	Other minerals.
1921	37,754	15,160	42,962	1,933			2,940 lbs.	379	Copper.
								1,650	Onyx and salt.
1922	65,747	11,686	9,820	540			4,338 lbs.	586	Copper
								8,304	Other minerals.
1923	34,661	3,120						10,000	Stone, miscellaneous.
								45,010	Other minerals.
1924	49,651	6,472	32,458	2,597				19,044	Stone, miscellanous.
								48,927	Other minerals.
1925	5,503	1,590	22,488	1,957				29,250	Stone, miscellaneous.
								146,300	Other minerals.
1926	20,204	121,404	20,906	1,672			2,628	368	Copper
								66,200	Other minerals.
1927	3,686	21,822	4,830	304				76,375	Other minerals, clay, copper, pumice, salt, andalusite, miscellaneous stone.
Totals	$22,983,203	$3,825,769	721,500	$33,882	20,129	$34,721		$644,497	

Year	Gold, value	Silver, value	Brick		Diatomaceous earth		Lime		Limestone	
			M	Value	Tons	Value	Barrels	Value	Tons	Value
1889	$3,500									
1890	11,815									
1891										
1892										
1893										
1894	8,000									
1895										
1896										
1897									2,000	$2,000
1898			400	$2,400					2,049	1,640
1899			200	1,400					7,744	6,970
1900			200	1,600					8,000	10,800
1901	13,800								5,463	7,500
1902	6,860	$18					22,000	$13,200		
1903	8,920						26,000	23,400	6,516	9,000
1904	6,941		200	1,600			3,240	3,240	4,550	21,500
1905	4,000						10,000	10,000		
1906	625	3			80	$400	40,000	50,000		
1907	1,076	9					100,000	125,000		
1908	1,318	9	426	3,838			50,000	50,000		
1909	333	5	300	2,900	500	3,500	50,006	62,507	10,658	45,678
1910	[2]1,013	10	993	9,957	500	3,500	30,894	29,349	2,500	7,500
1911					850	5,950			2,000	6,000
1912	[3]7,647	67							6,000	8,000
1913	6,491	27			1,700	6,800			6,500	13,000
1914	4,000	20								
1915					[4]					
1916					[4]					
1917					[4]				[4]	
1918					[4]					
1919					[4]					
1920					[4]					
1921					[4]					
1922										
1923					[4]					
1924					[4]	[5]				
1925	998	3			[4]					
1926	706	3			[4]					
1927	500	2			[4]					
Totals	$91,543	$176	2,719	$23,695	[3]3,630	$20,150	332,140	$366,696	[4]63,980	$139,588

[1] Includes crushed rock, rubble, sand, gravel.
[2] Incldues Monterey, San Luis Obispo and Santa Cruz counties.
[3] Includes Los Angeles and San Luis Obispo counties.
[4] See under 'Unapportioned.'
[5] Includes molding, building, blast, filter, roofing sand

COUNTY, 1889-1927.

Mineral water		Glass sand		Miscellaneous stone, value	Miscellaneous and unapportioned		
Gallons	Value	Tons	Value		Amount	Value	Substance
				$1,500			
5,000	$1,000						
2,000	200						
21,000	1,050			14,025			
1,500	750			8,258			
20,000	4,000			2,775			
15,000	3,250	4,500	$15,750	8,869	200 tons	$1,000	Coal.
15,000	1,750	4,500	12,225	5,200			
55,000	1,250	5,989	4,957	3,167	61 tons	732	Asphaltum.
25,000	1,000	8,295	7,272		124 tons	1,488	Asphaltum.
5,000	1,000	9,257	8,127				
24,000	12,000	750	1,125				
120,000	12,000	11,065	8,178		4,800 tons	24,000	Coal.
		6,805	5,120	31,727	7 flasks	296	Quicksilver.
10,000	2,000	6,496	4,872	43,351	1 flask	49	Quicksilver.
						344,789	Unapportioned, 1900-1909.
					7 flasks	317	Quicksilver.
		7,594	5,890	47,487	700 tons	5,000	Feldspar.
					200 tons	2,500	Fuller's earth.
				27,011	11,000 tons	4,950	Clay.
20,000	7,000	9,016	7,916	60,119	4,000 tons	6,000	Clay.
					320 tons	3,200	Coal.
20,000	7,000	9,141	9,192	12,556		78,332	Other minerals.
					35,000 tons	12,000	Clay.
					300 tons	2,700	Fuller's earth.
26,000		9,210	7,633		5,992 tons	17,976	Coal.
	7,900			39,202		9,450	Other minerals.
					700 tons	3,500	Feldspar.
					450 tons	3,150	Fuller's earth.
8,200	2,050	"		32,799		50,137	Coal, feldspar, diatomaceous earth, quicksilver, silica.
5,900	590			58,623		50,659	Barytes, feldspar, diatomaceous earth, quicksilver, salt, silica.
					6,392 tons	23,468	Dolomite.
		"		57,810		57,508	Barytes, diatomaceous earth, limestone, mineral water, quicksilver, salt, silica.
					4,900 tons	25,950	Dolomite.
		"		52,697	700 tons	3,800	Feldspar.
						37,240	Barytes, coal, diatomaceous earth, quicksilver, salt, silica.
		"		73,031	8,280 tons	29,120	Dolomite.
						43,353	Barytes, coal, feldspar, diatomaceous earth, salt, silica.
200	20	"		[84,056	5,755 tons	26,238	Dolomite.
						16,135	Barytes, coal, feldspar, diatomaceous earth, salt, silica, (glass sand).
		"		[63,316	2,500 tons	8,750	Dolomite.
						98,089	Asbestos, coal, diatomaceous earth, mineral water, salt, glass sand.
"		"		[86,180		169,139	Asbestos, coal, dolomite, quicksilver, salt, glass sand.
"		"		[140,724		81,298	Asbestos, diatomaceous earth, dolomite, mineral water, quicksilver, salt, glass sand.
					238 tons	436	Clay (pottery).
"	"			239,847	1,240 tons	4,960	Dolomite.
						41,247	Diatomaceous earth, mineral water, quicksilver, salt, shale, building stone, silica (glass sand).
					414 tons	1,161	Clay (pottery).
	"			409,423		66,136	Diatomaceous earth, quicksilver, salt, shale, building stone, silica (glass sand).
							Clay (pottery).
	"			263,244	491 tons	1,164	
						94,876	Diatomaceous earth, dolomite, salt, sandstone, (shale building stone), silica (glass sand).
							Clay (pottery).
	"			244,584	1,100 tons	550	
						105,413	Diatomaceous earth, dolomite, building stone (andesite, sandstone), quicksilver, salt.
[398,800	$65,810	[92,618	$98,261	$2,111,581		$1,559,256	

NAPA COUNTY,

Year	Quicksilver		Mineral water	
	Flasks	Value	Gallons	Value
Manhattan Mine output, 1863 to 1876	3,594	$235,876	[2]	
1862	444	16,139		
1863	852	35,852		
1864	2,714	124,573		
1865	3,545	162,716		
1866	2,254	119,755		
1867	7,862	360,866		
1868	9,808	450,187		
1869	6,598	302,848		
1870	5,766	330,853		
1871	4,098	258,584		
1872	4,876	321,475		
1873	5,266	423,018		
1874	11,705	1,231,132		
1875	9,453	795,470		
1876	11,303	497,332		
1877	13,127	489,637		
1878	10,810	355,649		
1879	9,446	281,961		
1880	6,830	211,730		
1881	7,746	231,063		
1882	9,013	254,467		
1883	7,784	223,790		
1884	5,188	158,234		
1885	3,891	119,648		
1886	5,656	200,788		
1887	6,247	264,717		
1888	5,150	218,875		
1889	5,402	243,090		
1890	3,934	206,535		
1891	4,896	221,544		
1892	8,612	350,595		
1893	11,505	422,809		
1894	9,705	298,016	97,275	$41,231
1895	9,318	372,500	199,397	99,700
1896	11,411	403,031	218,680	81,335
1897	12,281	459,753	159,896	81,948
1898	12,368	472,972	169,261	63,919
1899	11,696	598,322	171,567	85,964
1900	8,724	403,500	171,000	72,200
1901	7,798	388,176	158,830	109,900
1902	7,142	304,474	236,229	97,048
1903	7,859	333,006	244,400	124,000
1904	[3]5,328	199,586	386,000	104,750
1905	4,853	171,910	279,400	89,500
1906	2,380	86,870	84,000	90,500
1907	2,500	95,400	240,000	103,600
1908	2,340	98,912	145,500	101,000
1909	1,625	80,535	123,072	96,279
1910	646	29,231	152,772	92,960
1911	140	6,441	141,540	86,530
1912	287	12,065	136,750	81,997
1913	287	11,546	151,520	75,548
1914	240	11,772	142,940	73,280
1915	507	45,224	133,387	73,535
1916	1,150	107,525	152,764	93,370
1917	834	78,320	126,124	70,058
1918	1,297	143,850	92,512	59,620
1919	644	58,140	76,860	60,395
1920	266	18,588	80,431	38,621
1921	35	1,659	72,364	55,760
1922	189	5,143	80,481	54,341
1923	157	9,759	69,639	55,757
1924		[4]	73,608	53,391
1925			63,836	44,251
1926		[4]	80,376	49,468
1927	776	88,425	81,864	50,116
Totals	340,158	$15,515,457	4,994,275	$2,611,962

[1]Includes crushed rock, macadam, rubble, paving blocks, sand, gravel.
[2]Napa Soda Springs have been bottling water for sale since 1860; but no segregated figures available for Napa County previous to 1894.
[3]Flasks of 76½ pounds to June, 1904; of 75 pounds since.
[4]See under 'Unapportioned.'

1862-1927.

Magnesite		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
				$93,000	Gold and silver.
				5,000	Gold and silver.
				16,000	Gold and silver.
				22,500	Gold and silver.
				50,000	Gold and silver.
				95,000	Gold and silver.
				57,046	Gold and silver.
1,500	$6,000			30,517	Gold and silver.
				23,689	Gold and silver.
1,440	10,240		51 tons	2,040	Infusorial earth.
2,200	17,000				
1,500	11,000				
1,143	13,671				
1,263	19,075				
1,180	17,130				
1,983	17,400				
700	11,622		8,919 tons	6,690	Limestone.
150	450	$500	7,086 tons	8,496	Limestone.
61	915	3,375	290,368 bbls.	435,552	Cement.
12	78	4,019			
		500			
		2,777			
		3,000			
		78,728			
		138,636		3,151,182	Unapportioned, 1900 to 1909.
		122,219		2,893,786	Unapportioned, 1910 to 1913.
		127,428			
55	550	172,646			
		243,759		8,000	Sandstone.
		130,316		756,380	Other minerals.
1,050	9,450	108,387		647,625	Cement, sandstone.
			715 tons	11,559	Chromite.
13,960	108,556	88,441	119,500 cu. ft.	5,500	Building stone (tuff).
				663,586	Other minerals.
40,329	387,930	110,039	844 tons	22,020	Chromite.
				752,706	Cement, clay, copper.
29,163	263,367	82,944	667 tons	38,432	Chromite.
				1,088,154	Cement, gold, silver.
10,112	86,752	70,016			
[4]		74,550		98,382	Magnesite, volcanic ash.
		111,100		26,720	Other minerals.
[4]		200,151		52,635	Building stone (red tuff), mangesite.
		215,356		70,720	Other minerals
[4]		261,523		44,351	Magnesite, quicksilver.
				195	Gold.
		177,186		1,420	Silver.
				6,120	Other minerals.
				7,817	Gold.
		207,882		50,616	Silver.
				25,788	Other minerals.
				7,235	Gold.
		209,996		56,435	Silver.
				5,022	Copper, sandstone.
[4]107,801	$981,186	$2,945,474		$11,337,916	

NEVADA

Year	Copper		Gold, value	Granite	
	Pounds	Value		Cubic feet	Value
1880			$2,702,362		
1881			3,700,000		
1882			3,500,000		
1883			3,000,000		
1884			2,950,000		
1885			2,577,873		
1886			3,221,038		
1887			2,719,574		
1888			2,600,000		
1889			2,249,335		
1890			1,969,613		
1891			2,207,886		
1892			1,945,406		
1893			2,067,203		
1894	83,728	$7,535	1,830,155		
1895	33,255	3,325	1,789,816		
1896	28,200	2,820	2,380,756		
1897			1,885,251	1,100	$2,200
1898	30,000	3,000	2,017,628	2,000	1,500
1899	43,438	7,084	2,171,510	2,000	1,500
1900	150,980	20,472	1,812,036		
1901	39,588	6,235	2,121,054		
1902	26,500	3,975	2,142,740	1,000	3,000
1903	4,500	585	2,458,047	2,170	4,160
1904			3,130,304	2,335	5,395
1905			3,179,715	2,155	2,570
1906			2,658,420	9,525	9,300
1907	22,082	4,418	2,162,083	12,840	9,300
1908	30,166	4,104	2,297,963	700	2,100
1909			2,660,235	1,250	2,800
1910			2,533,483	2,225	3,215
1911	1,665	209	2,199,147	1,250	3,500
1912			2,081,958		
1913			2,918,733		
1914	39	5	3,301,948		
1915	1,817	318	3,466,722		
1916	3,487	858	3,669,878	100	100
1917	40,165	10,965	3,682,947		
1918	42,203	10,424	3,070,453		
1919	[2]		2,981,312	[2]	
1920	[2]		2,872,471	[2]	
1921			2,570,162	[2]	
1922	[2]		2,903,573	[2]	
1923	[2]		2,282,155	[2]	
1924	[2]		2,820,032	[2]	
1925	[2]		2,305,607	[2]	
1926	[2]		2,318,846	[2]	
1927	[2]		2,127,195	[2]	
Totals	[2]581,813	$86,332	$124,214,625	[2]40,650	$50,640

[1]Includes crushed rock, rubble, sand, gravel.
[2]See under 'Unapportioned.'

COUNTY, 1880-1927.

Lead		Silver, value	Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Pounds	Value			Amount, (tons)	Value	Substance
		$70,144				
		9,500				
		10,000				
		8,000				
		5,000				
		4,835				
		8,333				
		2,477				
		5,000				
		5,633				
		14,713				
		14,184				
		8,326				
		1,229				
		476		290	$5,800	Mineral paint.
		400		150	2,250	Mineral paint.
		8,584				
		8,116				
		19,476		50	1,000	Mineral paint.
				6,000	30,000	Pyrite.
		17,784		300	5,400	Mineral paint.
				5,400	28,620	Pyrite.
		66,841		2,925	17,550	Pyrite.
		18,122		78	429	Pyrite.
		6,124				
		3,252				
		9,555				
		32,523			20	Platinum.
		24,219				
		17,505				
663	$25	21,914	$1,678			
		24,926	1,874		400,000	Unapportioned, 1900-1909.
		16,506				
14,831	667	15,691				
1,785	80	22,830				
2,090	92	26,542	5,000			
145	6	27,000	2,108		60	Gems.
1,567	74	23,762	3,675		1,950	Other minerals.
1,036	71	35,741	1,225	981	12,795	Chromite.
					23,475	Manganese, platinum, tungsten.
[2]		52,335	1,600	1,962	43,449	Chromite.
					47,101	Asbestos, lead, platinum, tungsten concentrates.
[2]		72,557	1,400	3,328	116,993	Chromite.
					29,884	Asbestos, lead, manganese, platinum, tungsten concentrates.
[2]		68,731	1,976		12,034	Asbestos, barytes, chromite, copper, granite, lead, platinum.
[2]		58,476	6,528		17,531	Asbestos, barytes, copper, granite, lead.
		33,906	19,151		17,862	Asbestos, barytes, granite.
[2]		19,583	27,982		14,867	Barytes, copper, granite, lead, mineral paint.
1,290	90	30,534	42,309		15,682	Asbestos, barytes, copper, granite, mineral paint, platinum.
[2]		39,252	82,200		3,783	Copper, granite, lead.
[2]		32,155	10,333		4,782	Chromite, copper, granite, lead.
4,301	344	30,015	850,000		41,006	Barytes, copper, granite.
[2]		27,581	15,000		43,933	
27,768	$1,449	$1,080,388	$1,074,039		$938,296	

ORANGE

Year	Petroleum		Natural gas, value	Brick	
	Barrels	Value		M	Value
1889					
1890					
1892					
1894					
1895					
1897	12,000	$12,000			
1898	60,000	60,000		300	$2,400
1899	108,077	108,077		200	1,600
1900	254,397	254,397			
1901	302,652	181,591			
1902	1,103,793	824,492			
1903	1,355,104	1,016,285		1,634	13,000
1904	1,470,000	1,144,542		1,500	9,000
1905	1,510,900	711,633		118	11,800
1906	2,388,000	1,194,000		1,365	13,500
1907	2,426,750	1,456,050		3,176	26,000
1908	3,376,689	2,532,517		4,050	20,450
1909	4,270,967	2,690,709		4,090	20,650
1910	5,044,001	3,177,721		2,950	31,000
1911	6,345,275	4,097,980		1,650	11,550
1912	6,704,421	4,478,553	$5,250	1,300	9,100
1913	9,485,362	6,867,402	9,612	2,100	14,000
1914	12,758,678	8,612,108	112,040	1,333	19,300
1915	12,715,457	6,510,314	81,753	1,280	16,000
1916	13,198,591	8,750,666	139,281	1,186	8,300
1917	14,680,801	14,724,843	490,511	and tile	11,000
1918	15,730,462	22,211,412	693,169	477	3,869
1919	14,458,722	26,893,223	837,439	[2]	
1920	15,462,741	33,059,340	862,446	[2]	
1921	22,929,466	45,996,509	1,312,704	2,994	47,720
1922	31,049,491	36,483,162	2,096,629	4,706	73,106
1923	46,474,921	40,897,930	3,914,661	8,499	103,428
1924	31,661,283	37,455,298	2,397,813	[2]	
1925	32,734,420	46,384,673	2,324,014	3,253	39,445
1926	37,989,349	59,225,395	3,556,194	6,272	72,489
1927	46,593,842	56,238,767	3,910,501	1,283	13,143
Totals	394,656,612	$474,251,589	$22,735,017	55,716	$591,850

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.
[2] See under 'Unapportioned.'

COUNTY, 1889-1927.

Clay		Stone industry,[1] value	Miscellaneous minerals		
Tons	Value		Amount	Value	Kind
				$6,262	Gold.
				10,943	Gold.
				9,470	Gold.
			1,500 tons	6,000	Coal.
			900 tons	4,000	Coal.
				144	Gold.
			800 tons	3,200	Coal.
			600 tons	2,400	Coal.
			25 tons	250	Gypsum.
			240 cu. ft.	120	Sandstone.
				2,407	Gold.
			500 tons	2,250	Coal.
			300 tons	1,500	Coal.
				4,000	Gold.
				250	Gold.
				150	Gold.
			408 cu. ft.	200	Sandstone.
10,500	$14,581		500 cu. ft.	250	Sandstone.
7,740	12,900				
			964 lbs.	193	Copper.
			24,472 lbs.	1,303	Lead.
			33,546 lbs.	2,000	Zinc.
9,000	18,600	$3,005	14,405 lbs.	534	Lead.
2,617	26,170	23,665		72,586	Unapportioned 1900-1909.
500	5,000	6,443			
2,000	3,200	855			
2,100	3,400	21,248	459 tons	688	Glass sand.
15,500	20,666	36,815			
		88,315			
		9,027	364 lbs.	17	Lead.
			4 lbs.	1	Copper.
		3,773		3,066	Other minerals.
[2]		2,699		2,573	Pottery clay, copper, lead.
3,649	4,650	1,560			
[2]		1,944		18,499	Clay and clay products.
				97,632	Lead and potash.
			455 lbs.	84	Copper.
				145	Gold.
[2]		80,988	15,932 lbs.	1,275	Lead.
				7,263	Silver.
				96,595	Brick, clay, potash.
		131,301		10,796	Pottery clay, copper, gold, lead and silver.
		270,022		3,168	Clay (pottery), gold, lead and silver
		536,767		16,203	Clay (pottery), copper, gold, lead and silver.
				121,260	Brick and clay.
[2]		505,932		907	Copper, lead, silver.
				52	Gold.
13,431	42,562	307,112		995	Silver.
				5,637	Copper, lead, zinc.
13,150	38,989	317,767		60	Gold.
				414	Lead.
				967	Silver.
14,637	49,354	325,676		10,807	Copper, potash, zinc.
				9,600	Barite, quicksilver.
94,824	$258,561	$2,674,914		$520,617	

PLACER COUNTY,

Year	Gold, value	Silver, value	Copper		Brick		Pottery clay†	
			Pounds	Value	M	Value	Tons	Value
1880	$838,133	$640						
1881	850,000	6,500						
1882	800,000							
1883	810,000							
1884	887,320	5						
1885	906,301							
1886	1,071,663	1,397						
1887	855,510	556						
1888	850,000	1,000						
1889	1,245,491	1,975						
1890	1,003,602	1,045						
1891	998,495	5,021						
1892	1,159,080	2,120						
1893	1,351,250	616						
1894	1,851,215	664					22,000	$27,500
1895	1,599,635	5,273					15,000	15,000
1896	1,674,844	6,690					10,000	10,000
1897	1,524,941	6,784					7,500	7,500
1898	1,488,022	5,670					12,000	12,000
1899	1,100,081	1,206					15,000	15,000
1900	986,155	12,058					15,000	15,000
1901	900,745	4,828	11,200	$1,764			15,000	15,000
1902	843,366	3,341	3,200	368			15,000	15,000
1903	570,571	1,116	4,000	520			15,000	15,000
1904	778,355	9,320	600,000	76,500			16,100	16,100
1905	597,793	8,041	367,250	57,291			20,000	10,000
1906	[4]	[4]	200,000	38,600			20,000	15,000
1907	482,772	3,338					20,000	20,000
1908	358,096	2,194			13,000	$46,300	13,000	11,500
1909	281,372	1,492			2,083	52,300	45,300	35,250
1910	257,191	1,157			600	23,438	44,000	27,000
1911	251,298	2,585	118,624	14,828	700	18,000	43,120	29,200
1912	367,383	4,791	78,170	12,898	900	21,250	56,000	41,300
1913	220,785	2,972	429	67	1,900	40,000	63,600	47,200
1914	600,000	4,500	453	60	2,000	40,000	63,700	49,000
1915	414,319	24,543	[4]		2,000	40,000	49,126	37,536
1916	428,400	24,928	1,437,441	353,610	2,540	79,000	29,018	36,230
1917	538,686	13,885	710,601	193,994	[4]		44,097	44,097
1918	230,190	22,432	837,527	206,869	and tile	81,408	29,348	29,348
1919	170,609	3,141			[4]		[4]	
1920	151,088	2,178			and tile	149,924	65,560	76,500

†Figures for value of clay are for crude clay only. The annual value of clay products is several times greater, but is omitted because there is only one factory. Production began in 1875.

[1] Includes granite (prior to 1916), crushed rock, rubble, rip-rap, paving blocks, sand, gravel.

[2] Barrels of lime.

[3] Tons of limestone.

[4] See under 'Unapportioned.'

1880-1927.

Lime and limestone		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Amount	Value		Amount	Value	Substance
		$67,200			
		56,620	25 tons	$1,000	Asbestos.
		44,216			
		39,412			
		29,833			
		61,525			
		115,669			
		102,847			
		156,402			
[2]1,500	$9,000	198,530		280	Platinum.
[3]4,000	4,000			1,968	Quartz.
		123,448		375	Platinum
[2]15,533	8,737	116,746	2 ozs.	36	Platinum.
[2]11,699	11,950	71,130	0.66 ozs.	12	Platinum.
			50 tons	2,500	Asbestos.
[2]11,430	11,430	118,722			
[3]38,869	79,768		70 tons	3,500	Asbestos.
[2]1,727	1,710	178,460	50 tons	5,000	Asbestos.
[2]24,322	25,864	203,783		862,362	Unapportioned, 1901-1902.
			60 tons	6,000	Asbestos.
[2]10,000	12,100	242,773	200 tons	20,000	Asbestos.
			125 tons	500	Asbestos.
		218,951	300 tons	3,300	Magnesite.
			90 tons	584	Mineral paint.
			50 tons	500	Magnesite.
[2]222,595	200,000	231,415	1,000 tons	2,000	Glass sand.
		205,749	805 lbs.	35	Lead.
			2,000 tons	4,000	Quartz.
[2]202,575	202,575	203,593	385 lbs.	15	Lead.
[2]1,236	2,432	98,187	711 lbs.	33	Lead.
				346,810	Asbestos and copper.
			744 tons	11,956	Chromite.
		17,026		80,931	Granite.
				10,548	Lead, limestone, magnesite.
			4,287 tons	105,384	Chromite.
		10,727		30,392	Granite.
				92,624	Asbestos, brick, platinum, tile, gems, magnesite.
			4,963 tons	276,765	Chromite.
		4,266		30,882	Granite.
				21,360	Manganese and silica.
			1,018 tons	24,000	Chromite.
		4,330		98,513	Clay and clay products.
				36,233	Granite.
				1,055	Other minerals.
			300 tons	7,985	Chromite.
		6,688		212,625	Granite.
				5,825	Other minerals.

PLACER COUNTY.

Year	Gold, value	Silver, value	Copper		Brick		Pottery clay†	
			Pounds	Value	M	Value	Tons	Value
1921	$132,468	$1,068	----------	----------	and tile	$144,508	76,665	$95,930
1922	119,673	952	----------	----------	and tile	118,797	79,531	111,166
1923	75,732	297	----------	----------	----------	----------	82,919	143,097
1924	108,757	534	----------	----------	and tile	186,053	97,670	146,508
1925	121,785	620	----------	----------	and tile	147,981	102,598	138,813
1926	82,921	346	----------	----------	and tile	150,591	104,250	147,241
1927	97,494	440	----------	----------	----------	----------	61,388	106,710
Totals	$33,033,587	$205,129	4,368,895	$957,369	----------	$1,339,550	1,368,490	$1,561,726

[5] Includes chromite, mineral paint, mineral water.
[6] Includes brick, building tile, chromite.
[7] Includes mineral paint, mineral water, silica (quartz).
[8] Includes chromite, copper, silica (quartz).

1880-1927—Continued.

Lime and Limestone		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Amount	Value		Amount	Value	Substance
----------	----------	$21,490	----------	$48,328	Granite.
			----------	5,278	Chromite, mineral paint, silica.
----------	----------	24,430	----------	12,980	Granite.
			2,000 tons	5,500	Silica.
			----------	12,477	Other minerals[5].
----------	----------	139,829	----------	5,146	Granite.
			3,656 tons	10,040	Silica (quartz).
			----------	120,372	Other minerals.[6]
----------	----------	15,573	----------	19,155	Granite.
			----------	15,600	Other minerals.[7]
----------	----------	117,990	----------	14,929	Granite.
			----------	8,295	Other minerals.[8]
----------	----------	81,814	6092 cu. ft.	11,969	Granite.
			----------	6,000	Other minerals.
----------	----------	40,357	8,590 cu ft.	18,109	Granite.
			2,700 tons	8,100	Silica.
			----------	89,014	Other minerals.
----------	$569,566	$3,369,740	----------	$2,719,180	

PLUMAS COUNTY,

Year	Copper		Gold, value	Silver, value
	Pounds	Value		
1880			$857,124	$181
1881			1,350,000	2,000
1882			1,250,000	
1883			950,000	
1884			900,000	
1885			840,308	
1886			834,452	62
1887			698,069	16
1888			650,000	250
1889			796,754	235
1890			490,664	811
1891			482,462	
1892			432,295	11,731
1893			362,488	14
1894			499,359	
1895			602,951	271
1896			462,527	83
1897			339,252	701
1898			369,609	
1899			381,151	15
1900			365,210	4,159
1901			401,287	2,508
1902			380,686	517
1903	1,900	$247	424,112	510
1904			270,439	464
1905	1,006	157	283,810	530
1906			229,350	1,055
1907			219,355	948
1908			254,737	3,560
1909			157,491	587
1910			187,207	1,038
1911			228,785	1,125
1912	6,963	1,149	193,237	957
1913	[2]19,533	3,028	138,368	705
1914	[2]169,089	22,489	140,000	2,900
1915	3,164,496	553,787	167,440	19,025
1916	4,932,928	1,213,500	133,385	46,542
1917	7,462,870	2,037,364	131,955	74,461
1918	11,098,016	2,741,210	125,207	156,750
1919	10,193,951	1,896,075	83,600	175,846
1920	9,583,834	1,763,425	102,097	153,373
1921	11,584,216	1,494,364	127,148	171,090
1922	20,677,771	2,791,499	223,025	297,254
1923	22,883,609	3,363,891	174,871	243,970
1924	25,557,362	3,348,015	277,571	247,569
1925	26,950,029	3,826,904	249,540	294,254
1926	22,163,035	3,102,825	247,667	216,620
1927	21,055,425	3,758,261	321,016	179,108
Totals	197,506,033	$31,918,190	$19,788,061	$2,313,795

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]See under 'Unapportioned.'
[3]Includes copper erroneously credited to Lassen County in those years, on account of shipping point being Doyle, though the mines were located in Plumas County.

1880-1927.

Manganese		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
1	$10				
2	40				
1	25				
1	30			$25	Platinum.
1	25	$5,000			
1	25				
3	75	2,000		75,575	Unapportioned, 1900-1909.
5	75	12,500	1,115 lbs.	50	Lead.
2	40		1,329 lbs.	60	Lead.
2	40	1,350	5,856 lbs.	264	Lead.
		1,700	5,621 lbs.	247	Lead.
		1,879	2,058 lbs.	80	Lead.
		5,431		32	Other minerals.
		1,988		3,920	Chromite, granite, molybdenum.
1,540	39,680	1,322	473 tons	9,800	Chromite.
				304	Gems, granite, silica.
1,544	61,754	7,750		23	Other minerals.
[2]		850		1,825	Limestone, manganese.
		62,109		2,658	Granite, lead, lime, platinum.
			2,961 lbs.	133	Lead.
		[2]	18 fine oz.	1,615	Platinum.
				4,111	Granite and miscellaneous stone.
				2,720	Granite, platinum, miscellaneous stone.
		780		750	Other minerals.
				2,950	Chromite, granite.
				30,810	Chromite, granite, manganese ore, miscellaneous stone.
				5,516	Granite, lead, manganese ore, platinum.
				2,338	Granite, lead, lime.
[2]2,103	$101,819	$104,659		$145,806	

RIVERSIDE COUNTY (see p. 226)

SACRAMENTO

Year	Gold, value	Silver, value	Platinum		Brick	
			Ounces	Value	M	Value
1880	$342,514					
1881	425,000	$1,000				
1882	400,000					
1883	480,000					
1884	270,000					
1885	353,522					
1886	280,000					
1887	158,526	176				
1888	150,000					
1889	210,075					
1890	193,585					
1891	142,830	4				
1892	121,900					
1893	90,091					
1894	70,326				11,250	$56,250
1895	145,873				13,125	65,625
1896	133,050				8,700	44,200
1897	93,050				3,100	16,700
1898	57,301				11,000	44,000
1899	115,906				15,600	93,600
1900	176,007	[2]473			8,900	53,400
1901	229,034	[2]253			12,236	62,180
1902	425,894	330			10,492	78,198
1903	335,646	234			15,000	120,000
1904	419,287	75			4,500	20,000
1905	668,382	206	40	$700	18,000	130,000
1906	986,624	3,640	11	200	12,000	108,000
1907	790,973	2,034			16,078	128,624
1908	1,166,055	1,621			7,936	63,491
1909	1,669,814	2,856				
1910	1,396,874	4,606				
1911	1,812,826	3,047			13,017	76,571
1912	1,712,587	3,544			26,073	161,535
1913	2,503,633	3,406			22,535	144,191
1914	2,164,491	3,481	223	7,108	22,862	160,923
1915	2,131,813	3,151	196	6,217	9,920	82,973
1916	1,833,855	3,578	195	8,892	8,924	91,615
1917	1,919,581	4,487	157	12,453	and tile	122,886
1918	1,694,724	4,637	[3]			79,312
1919	1,714,193	5,276	[3]		[3]	
1920	1,575,033	4,534	[3]			248,433
1921	1,690,662	5,254	[3]			216,402
1922	1,350,749	3,392				259,263
1923	1,331,227	2,566	[3]			327,636
1924	1,150,687	1,753				290,213
1925	1,302,320	1,920				354,078
1926	1,304,046	1,627				388,697
1927	1,211,278	1,472				295,677
Totals	$40,901,844	$74,633	[1]822	$35,570		$4,389,673

[1] Includes crushed rock, rubble, rip-rap, sand, gravel, paving blocks.
[2] Recalculated to 'commercial' from 'coining value' as originally published.
[3] See under 'Unapportioned.'
[4] State Prison use, value estimated, as none reported.

COUNTY, 1880-1927.

Granite		Natural gas		Miscellaneous stone,[1] value	Miscellaneous and unapportioned		
Cubic feet	Value	M cubic feet	Value		Amount	Value	Substance
75,000	[4]$35,000						
85,000	[4]45,000						
				$12,108			
207,845	62,339			28,074		$1,500	Pottery clay.
4,810	4,000	15,000	$12,000	14,137			
1,524	1,145	12,000	10,000	13,105			
2,137	3,139	11,750	11,750	14,157			
2,635	2,882			7,926		316	Copper.
288	136	38,550	31,200	19,380			
20,471	2,222	31,680	30,518	18,176			
5,164	4,458	39,200	39,200	22,103			
4,327	1,614	43,564	43,564	32,386			
10,905	1,779	60,225	52,874	18,141			
26,105	4,625	60,225	52,874	13,936			
44,151	44,151	55,000	55,000	151,477			
31,660	23,745	60,000	60,000	235,210		314,438	Unapportioned, 1900-1909
68,684	59,947	49,203	49,203	164,592			
45,630	2,307	9,000	83,890	131,037			
		100,000	96,000	197,733			
		72,000	36,000	238,476			
		80,000	40,000	253,235			
		108,000	54,000	284,127			
		[3]		194,718	227 lbs.	16	Lead.
						46,000	Pottery clay, natural gas.
						27,000	Other minerals.
		[3]		199,839	310 tons	410	Pottery clay.
		[3]		262,689		61,235	Natura gas, platinum, potash.
		[3]		276,732		113,000	Clay and clay products.
						61,395	Natural gas and platinum.
		[3]		180,563		57,591	Natural gas and platimun.
	39,469	[3]		386,911		56,196	Natural gas and platinum.
	51,500			412,667		111,991	Natural gas and platinum.
	30,740	[3]		649,939		93,907	Natural gas and platinum.
	11,150	[3]		639,811	1,750 tons	4,470	Clay (pottery).
						98,126	Natural gas, platinum.
	155,250	[3]		590,359		2,748	Clay (pottery).
						97,730	Natural gas, platinum.
	7,812	[3]		438,086	1,528 tons	2,310	Clay (pottery).
						101,374	Natural gas, platinum.
	33,600	[3]		754,206		52,683	Clay (pottery), natural gas, platinum.
	$628,010	[3]926,397	$758,073	$6,855,946		$1,304,436	

SAN BENITO

Year	Quicksilver		Lime		Gypsum	
	Flasks	Value	Barrels	Value	Tons	Value
1865	[2]17,455	$943,617				
1866	6 525	346,673				
1867	11,493	527,529				
1868	12,180	559,062				
1869	10,315	473,459				
1870	9,888	567,373				
1871	8,180	516,158				
1872	8,171	538,714				
1873	7,735	621,353				
1874	6,911	726,899				
1875	8,132	709,553				
1876	7,272	319,968				
	[3]2,000	139,000				
1877	6,316	235,587				
1878	5,138	169,040				
1879	4 425	132,018				
1880	3,209	99,479				
1881	2,775	82,778				
1882	1,953	55,123				
1883	1,606	46,173				
1884	1,025	31,263				
1885	1,144	35,178				
1886	1,406	49,913				
1887	1,890	80,088				
1888	1,320	56,100				
1889	980	44,100				
1890	977	51,293				
1891	792	35,838				
1892	818	34,523				
1893	869	31,936				
1894	1 005	30,861	40,000	$11,000	762	$9,144
1895	1,100	36,000	41,000	41,000	750	8,250
1896	1,335	46,725	40,000	35,000	300	3,000
1897	3,605	135,185	25,000	18,500	300	2,000
1898	5,000	190,000			500	4,500
1899	4,780	245,000	16,600	18,675	100	700
1900	3,990	180,000	7,300	8,800		
1901	4,800	242,300				
1902	7,291	306,081				
1903	8,180	344,251				
1904	[5]8,480	314,000				
1905	7,764	279,651	15,000	15,000		
1906	7,203	262,909				
1907	7,675	292,878	8,453	8,453		
1908	9,600	405,792			2,000	8,000
1909	8,900	440,241			6,000	34,576
1910	10,800	488,700			12,000	50,000
1911	9,775	449,748			10,000	30,625
1912	9,743	409,596			8,000	32,000
1913	9,719	390,995			11,000	35,000
1914	6,633	325,349			7,000	21,000
1915	6,291	475,370				
1916	11,110	1,032,156				
1917	11,150	1,057,770				
1918	10,715	1,234,027				
1919	7,409	668,989				
1920	3,887	296,942				
1921	[6]					

[1] Includes, crushed rock, rubble, rip-rap, sand, gravel.
[2] Production of New Idria Mine from 1858-1866; yearly details not obtainable, though New Idria began operation in 1850.
[3] Estimated output of Cerro Bonito, Monterey and Stayton mines, 1870-1877; yearly details concealed under heading of 'various mines' in early reports.
[4] Includes bituminous rock.
[5] Flasks of 75 pounds since June, 1904; 76½ pounds previously.
[6] See under 'Unapportioned.'

COUNTY, 1865-1927.

Mineral water		Miscellaneous stone[1], value	Miscellaneous and unapportioned.		
Gallons	Value		Amount	Value	Substance

Year	Quicksilver		Lime		Gypsum	
	Flasks	Value	Barrels	Value	Tons	Value
1922	[6]					
1923	[6]					
1924	4,670	$320,758				
1925	6,085	486,797				
1926	[6]					
1927	4,380	485,409				
Totals	[6]356,305	$20,134,298	193,353	$189,428	58,712	$238,795

[1] Includes crushed rock, rubble, rip-rap, sand, gravel.
[6] See under 'Unapportioned.'

COUNTY, 1835-1927—Continued.

Mineral water		Miscellaneous stone,[1] value	Miscellaneous and unapportioned		
Gallons	Value		Amount	Value	Substance
[e]		259,805	6,650 tons	30,100	Dolomite.
				1,504,343	Asbestos, cement, magnesite, mineral water, quicksilver.
[e]		424,854		1,853,049	Asbestos, cement, dolomite, magnesite, mineral water, quicksilver.
[e]		269,369		1,551,476	Asbestos, cement, coal, dolomite, magnesite, mineral water.
		351,363		1,779,236	Asbestos, cement, dolomite, magnesite, mineral water.
		328,460		2,072,390	Antimony, asbestos, cement, dolomite, magnesite, mineral water, quicksilver.
		371,050		1,045,395	Antimony, asbestos, cement, mineral water, pyrite.
[e]128,720	$25,415	$4,117,097		$12,841,526	

SAN BERNARDINO COUNTY (see p. 227)

SAN DIEGO

Year	Gold, value	Silver, value	Brick		Gems, value	Granite, value	Mineral water	
			M	Value			Gallons	Value
1880	$81,558							
1881	60,000							
1882	100,000							
1883	50,000	$5,000						
1884	65,000	5,000						
1885	95,125	2,000						
1886	140,450	78,758						
1887	66,900	198,537						
1888	160,000	192,000						
1889	275,440	25,740						
1890	453,800	100						
1891	467,000							
1892	396,518	2,051						
1893	105,860							
1894	266,409	190						
1895	344,308	600					48,000	$11,500
1896	560,578	40					45,000	35,000
1897	592,328						25,000	5,000
1898	673,196	300	672	$2,688		$4,875	4,320	3,000
1899	333,650		860	4,300		8,150	12,000	6,000
1900	335,937	[2]9,500	734	3,261	$500	9,900	6,500	3,250
1901	413,320	[2]2,800	1,158	5,791	20,000	22,400	6,000	3,000
1902	338,877	1,994	688	3,440	150,000	13,175	5,158	1,289
1903	461,516	1,444	2,150	11,150	100,000	16,308	6,000	3,000
1904	334,697	100	3,824	23,700	136,000	7,851		
1905	109,712	100	3,190	28,350	66,000	10,250		
1906	[3]		3,950	34,900	284,500	10,250		
1907	7,455	35	4,474	36,430	206,336	23,650	2,000	2,000
1908	6,920	86	2,112	16,719	121,500	10,000	9,810	11,772
1909	12,812	1,721	5,844	38,946	125,000		10,210	12,022
1910	[4]		8,813	62,647	110,300		40,550	30,110
1911	[4]		9,500	68,000	25,000		60,090	87,020
1912			10,500	80,000	12,500		52,060	17,218
1913			9,384	68,400	7,465		41,500	15,225
1914			5,457	56,392	1,150		8,865	911
1915	1,364	9	1,260	21,025	2,465		10,350	1,035
1916			4,001	36,842	2,710	[3]	[3]	
			and tile					
1917		[3]		21,423	[3]	[3]	[3]	
1918				29,080		[3]	[3]	
1919	1,470	12		[3]	[3]	15,215	[3]	
1920				87,612	2,100	7,838		
1921	[3]	[3]		[3]	1,405	22,444	70,924	9,161
1922	[3]	[3]			400	35,673	71,781	9,262

[1]Includes crushed rock, rubble, rip-rap, sand, gravel, paving blocks, grinding-mill pebbles.
[2]Recalculated to 'commercial' from 'coining value' as originally published.
[3]See under 'Unapportioned.'
[4]Included under Imperial County production.

COUNTY, 1880-1927.

Salt		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
700	$5,000	$49,374	50 tons	$2,250	Asbestos.
700	5,000	25,000			
600	4,800	3,573			
650	5,850	23,390			
600	5,000	5,359			
600	5,000	18,198	31,000 lbs.	1,317	Lead.
			124 tons	4,600	Lithia mica.
600	4,000	14,403	440 tons	11,000	Lithia mica.
1,060	9,620	6,887	1,100 tons	27,500	Lithia mica.
7,900	7,900	14,175	822 tons	31,880	Lithia mica.
		42,597	700 tons	27,300	Lithia mica.
		200,192	641 tons	25,000	Lithia mica.
		16,507	4,808 lbs.	750	Copper.
			25 tons	276	Lithia mica.
6,000	5,000	49,738			
			13,246 lbs.	2,659	Copper.
7,000	55,000	28,500	971 lbs.	52	Lead.
			4,000 cu. ft.	12,000	Marble.
7,000	60,000	37,122			
15,000	60,000	33,510		214,634	Unapportioned, 1900-1909.
8,000	24,000	147,817			
13,000	37,500	201,488			
12,450	31,350	164,115	403 tons	500	Pottery clay.
20,500	51,750	170,014	838 tons	2,840	Pottery clay.
15,300	46,200	210,250	30 lbs.	4	Copper.
				1,365	Other minerals.
17,616	19,616	163,723	3,008 lbs.	526	Copper.
			23 lbs.	1	Lead.
			2,150 tons	175,804	Potash.
[2]		163,925	16,806 lbs.	4,134	Copper.
				13,140	Granite, lithia, mineral water, satl.
			283 tons	613	Pottery clay.
			153,349 lbs.	43,502	Copper.
4,500	9,750	125,855	5,252 tons	1,492,123	Potash.
				21,055	Pottery clay, gems, granite, lithia, mineral wa e molybdenum, silica, silver.
			4,143 lbs.	1,023	Copper.
10,631	61,717	184,158	700 tons	3,600	Feldspar.
			10,392 tons	1,578 874	Potash.
				83,698	Granite, lithia, mineral water.
12,400	52,800	141,996		62,929	Clay and clay products.
				68,790	Copper, gems, lithia, mineral water, potash, silica.
			5,852 tons	57,522	Pottery clay.
15,300	77,100	333,847	2,953 tons	17,715	Feldspar.
			7,557 tons	18,893	Silica (glass sand).
				191,602	Lithia, magnesium salts, mineral water, tantalum ore (columbite).
				92,600	Clay and clay products.
[2]		187,922	370 tons	725	Glass sand.
			1,850 tons	11,100	Feldspar.
				176,036	Gold, lithia, magnesium salts, marble, salt, silver.
			3,500 tons	29,500	Feldspar.
[3]		355,810		93,045	Clay and clay products.
				133,117	Fuller's earth, gold, lithia, magnesium salts, marble, salt, silica, silver.

SAN DIEGO

Year	Gold, value	Silver, value	Brick		Gems, value	Granite value	Mineral water	
			M	Value			Gallons	Value
1923	$822	$144	[1]	[1]	$8,530	$40,600	59,795	$6,570
1924	4,830	97	----------	$232,113	1,925	94,006	107,097	8,642
1925	5,134	58	----------	119,165	9,413	108,703	81,374	21,137
1926	10,543	340	----------	230,484	4,000	45,327	156,380	23,259
1927	11,490	92	----------	165,170	3,500	63,142	109,685	51,559
Totals	$7,345,019	$528,848	----------	$1,488,028	$1,402,699	$569,757	1,049,449	$377,892

[1] See under 'Unapportioned.'

COUNTY, 1830-1927—Continued.

Salt		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
			5,603 tons	100,977	Pottery clay.
----------	----------	$343,959	6,100 tons	42,800	Feldspar.
			----------	277,394	Brick and tile, fuller's earth, lead, magnesium, chloride, marble, salt, silica (quartz).
			12,783 tons	36,941	Pottery clay.
			6,850 tons	47,950	Feldspar.
[3]	----------	379,094	109 tons	2,269	Lithia.
			----------	205,252	Arsenic, fuller's earth, magnesium chloride, salt.
			26,976 tons	66,427	Clay (pottery).
[3]	----------	508,538	----------	291,182	Feldspar, fuller's earth, lime, magnesium chloride, salt, silica.
			30,187 tons	58,269	Clay (pottery).
			7,000 tons	54,000	Feldspar.
[3]	----------	529,640	----------	258,462	Bromine, copper, fuller's earth (filtering clay), lead, lithia, magnesium chloride, salt, zinc.
			16,190 tons	31,765	Clay (pottery).
			7,396 tons	69,661	Fuller's earth.
	----------	889,642	----------	333,410	Bromine, feldspar, lithia, magnesium chloride, paving blocks, salt, heptane.
[3]178,107	$643,953	$5,770,318	----------	$6,614,353	

SAN FRANCISCO COUNTY, 1894-1927.

Year	Brick		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
	M	Value		Amount	Value	Substance
1894			$296,864	20 tons	$25	Limestone.
1895			379,696			
1896	5,000	$37,500	285,167			
1897	4,500	28,500	86,217			
1898			129,595			
1899			275,604			
1900			58,400			
1901			156,947			
1902	25,800	238,800	156,300			
1903	33,403	294,326	508,460			
1904	39,509	367,911	332,220			
1905	32,585	310,685	114,357			
1906	7,208	58,289	106,250	8,500 tons	10,500	Glass sand.
1907	44,578	434,140	97,273	4,000 tons	60,000	Asphalt.
1908	41,837	345,155	95,259	1,500 tons	15,000	Asphalt.
1909	31,430	221,332	150,382	850 tons	9,800	Asphalt.
					30,000	Unapportioned, 1900-1909.
1910			108,126	1,000 tons	12,000	Asphaltum.
1911			119,636			
1912			151,147			
1913			110,551			
1914			119,889			
1915			128,270			
1916			76,437			
1917			107,957			
1918			16,463			
1919			65,541			
1920			77,553		2,800	Other minerals.
1921			41,562			
1922			[2]		65,409	Pumice, miscellaneous stone.
1923			117,341			
1924			150,258			
1925			131,158			
1926			112,193			
1927			62,700			
Totals	265,850	$2,336,638	$4,925,863		$205,509	

[1]Includes crushed rock, rubble, sand, gravel

1922

1923

1924

1925

1926

1927

Totals

[1]Includes crus
[2]Combined an
[4]See under 'U

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Year	Gold, value	Silver, value	Copper		Lead		Borax, value	Gypsum		Salt		Cement		Lime		Limestone		Brick		Marble		Miscellaneous stone[1], value	Gems, value	Miscellaneous and unapportioned		
			Pounds	Value	Pounds	Value		Tons	Value	Tons	Value	Barrels	Value	Barrels	Value	Tons	Value	M	Value	Cubic feet	Value			Amount	Value	Substance
1880																										
1881	$9,000	$100,000																								
1882	20,000	150,000																								
1883	30,000	1,050,000																								
1884	32,000	2,850,000																								
1885	23,000	2,363,436																								
1886	56,464	1,204,750																								
1887	27,850	1,133,268																								
1888	25,009	1,200,000																								
1889	10,737	621,820																								
1890	17,335	795,465																								
1891	62,970	711,157																								
1892	47,037	67,072																								
1893	158,000	447,020																								
1894	130,420	148,243					$726,500			1,000	$3,000	8,000	$21,600	40,000	$32,000	5,000	$6,250					$31,622				
1895	131,360	219,410					555,900			3,841	20,101	16,283	32,556	87,864	87,674	30,000	30,000					37,672				
1896	96,723	130,714					650,500			3,000	15,000	9,000	27,000	37,427	34,977	17,500	17,500			500	$3,000	28,476				
1897	100,373	54,407					1,080,000					18,000	66,000	12,000	12,000											
1898	261,512	32,000					1,120,000					50,000	150,000	50,000	35,000	5,600	6,000	2,000	$16,800	1,200	8,000	15,040				
1899	164,599	125,603	1,369,878	$232,339			1,106,000					60,000	180,000	16,000	16,100	16,440	14,810	1,000	8,000	4,500	625	11,275				
1900	247,949	172,759	1,920,000	297,600	10,000	$400	999,340					52,000	121,000	26,261	33,261	7,067	7,067					65,757	$20,000			
1901	399,693	57,184	50,000	7,875	500	20	898,130					71,800	159,842	38,783	43,028	54,210	76,710					166,777	20,000			
1902	394,936	58,972	338,480	41,008	39,340	2,076	2,198,860					96,000	273,600	76,582	65,832	48,986	51,578	60	1,800	6,005	15,600	192,400	11,600			
1903	381,197	59,199	60,400	7,852	14,000	504	495,000					100,000	157,000	39,923	28,692	52,813	64,613	100	8,000	38,000	41,600	266,961	10,000			
1904	595,828	13,025	169,477	17,270										25,000	21,500	28,421	42,575	2,500	17,500	31,116	53,400	158,656		4,000 cu. ft.	$2,000	Sandstone.
1905	473,893	19,595	52,603	8,206										17,024	14,740	27,357	51,395			40,100	40,000	147,197	65,000			
1906	354,830	33,765	514,031	99,207										20,910	17,146	19,837	35,990	1,800	13,500	7,200	25,000	38,476		10 tons	5,500	Tungsten.
1907	158,676	81,339	514,282	102,856	34,211	1,822								8,600	8,600	74,709	139,188	1,685	15,555	6,482	29,946	147,942				
1908	180,511	35,704	516,840	71,079	409,570	17,218		20,000	$70,000	90	650					104,236	97,466	1,050	7,350	150	500	231,242	200			
1909	40,071	12,570	316,300	40,418	310,200	13,254		12,500	43,000	3,500	14,000					22,197	41,395	1,709	11,966	50,000	125,000	173,777	200	300 tons	3,000	Pottery clay.
																								430 tons	4,300	Pottery clay.
																								108,000 gals.	25,000	Mineral water.
																								60 tons	840	Barytes.
																								100 tons	1,000	Soapstone.
1910	55,093	10,164	5,412	689	134,312	5,972		31,519	70,357	3,000	9,000					224,610	157,715	1,910	11,460			95,126	1,120	920 tons	4,060	Pottery clay.
																								350 tons	350	Pottery clay.
																								200 tons	1,200	Mineral paint
																								50 tons	550	Barytes.
1911	127,367	35,542	666,489	83,311	161,338	7,260		20,584	66,505	3,600	13,800					245,102	177,080					167,213		4,500 gals.	25,000	Mineral water.
1912	293,900	49,962	1,937,185	319,636	94,852	4,268		21,000	67,000	3,600	12,600	[2]2,361,000	2,996,200			80,186	97,867	1,340	8,040			580,824	450		1,391,304	Other minerals.
1913	356,524	44,413	497,852	77,167	279,241	12,287		25,000	74,000	3,049	10,573	[3]		121,544	113,856	25,896	35,484	350	2,100			364,312	550	44,100 gals.	5,100	Mineral water.
																								4,500 gals.	25,000	Mineral water.
																								80 tons	561	Mineral paint.
1914	205,000	40,000	19,069	2,536	45,110	1,750		17,332	49,150	482	2,892	[3]		84,637	93,100	23,006	20,880	25	1,250			131,978		140 tons	400	Glass sand.
																									1,340,575	Other minerals.
																								37,480 gals.	7,350	Mineral water.
1915	416,967	64,165	209,440	36,652	169,183	7,952		[3]		542	3,324	915,000	980,000	[3]		68,500	68,500	400	2,400	[3]		178,528		864 tons	840,947	Tungsten concentrates.
																								39,848 lbs.	4,941	Zinc.
																									62,316	Dolomite, gypsum, lime, manganese, marble, mineral paint, soapstone and talc.
																								7,500 cu. ft.	2,500	Granite.
																								40,500 gals.	6,500	Mineral water.
1916	279,813	67,146	1,577,901	388,164	873,801	46,492		[3]		2,355	13,830	1,036,000	1,246,000	151,670	54,317	65,174	63,486	[3]				172,454	1,000	1,921 tons	3,915,434	Tungsten concentrates.
																								707,062 lbs.	84,746	Zinc.
																									217,265	Brick, dolomite, feldspar, gypsum, manganese, mineral paint, pumice, potash, talc, strontium.
																									2,350	Granite.
																									187,571	Lime and limestone.
																								235 tons	6,050	Manganese.
																								11,300 gals.	1,620	Mineral water.
1917	154,976	88,930	1,220,358	333,157	2,293,541	197,245		[3]		[3]		1,323,931	1,672,054	[3]		[3]		[3]				111,158	[3]	14,570 tons	2,049,120	Potash.
																								3,050 tons	37,000	Strontium.
																								1,943 tons	2,447,726	Tungsten concentrates.
																								38,735 lbs.	3,951	Zinc.
																									114,834	Brick, pottery clay, dolomite, feldspar, gems, gypsum, iron ore, mineral paint, salt, soda, talc.
																								270 tons	$10	Dolomite.
																								601,500 gals.	60,150	Mineral water.
1918	29,225	88,712	1,580,998	390,507	667,978	47,428		[3]				1,027,635	1,453,962	[3]		10,852	13,323			[3]		48,451	[3]	27,545 tons	3,428,443	Potash.
																								430 tons	4,210	Talc.
																								2,900 tons	33,000	Strontium
																								1,347 tons	1,911,966	Tungsten concentrates.
																								2,824 lbs.	257	Zinc.
																									122,348	Gems, granite, gypsum, iron ore, lime, magnesite manganese, marble, mineral paint, salt
																								800,060 gals.	32,006	Mineral water
1919	39,769	427,717	256,933	47,790	105,796	5,607	[3]	19,613	50,154			1,078,943	1,717,998	[3]								183,388	[3]	21,171 tons	1,670,919	Potash.
																								3,601 tons	19,845	Talc.
																									443,492	Borax, pottery clay, dolomite, gems, lime, tungsten.
																								95 tons	890	Pottery clay.
1920	79,195	1,212,987	5,386	991	115 876	9,270	440,411	[3]		202	1,220	1,681,283	3,051,079	[3]		[3]						169,991	[3]	1,110,190 gals.	156,726	Mineral water.
																								15,435 tons	1,082,037	Potash.
																									336,551	Dolomite, gems, granite, gypsum, iron ore, lime, limestone, soda, talc.
																								683 tons	22,980	Calcium chloride.
1921	217,568	3,210,706	17,054	2,200	22,812	1,027	338,905	[3]		13,279	67,782	1,964,926	4,633,437	[3]		21,862	109,165					145,572	[3]	7 202 tons	211,067	Potash
																								2 750 tons	45,375	Talc
																									374,726	Pottery clay, dolomite, feldspar, gems, granite, gypsum, iron ore, lime, mineral water, pumice, soda.
1922	125,728	2,374,918	13,452	1,816	11,188	615	[3]	[3]		12,222	54,259	2,770,953	4,156,430	[3]		2,200	7,800					[3]			1,820,304	Borax, calcium chloride, fuller's earth, gems, gypsum, lime, mineral water, potash, soda, talc miscellaneous stone.
1923	210,923	2,225,959	13,328	1,959	34,477	2,413	[3]	[3]		17,350	65,550	3,554,764	8,478,612	[3]		5,859	28,324					351,151		830 tons	12,630	Clay (pottery).
																								7,248 tons	123,216	Talc.
																									2,276,516	Borates, calcium chloride, gems, gypsum, lime, mineral water, potash, soda (trona), tungsten concentrates.
1924	187,573	1,531,598	17,667	2,314	31,668	2,533				29,699	99,791	4,354,119	7,571,370	[3]		14,375	45,137					355,946		7,234 tons	125,926	Talc.
																									2,720,243	Borates, calcium chloride, clay (pottery), fuller's earth, gypsum, lime, mineral water, petroleum, potash, soda (trona), tungsten concentrates.
1925	157,374	1,376,392	6,240	888	61,480	5,349				28,319	101,085	5,079,281	8,828,044	17,495	124,446	13,239	27,589					395,048		1,540 tons	11,000	Clay (pottery).
																									3,150,468	Borates, calcium chloride, fuller's earth, mineral water, petroleum, potash, soda (trona), talc, tungsten concentrates.
																								2,268 tons	19,605	Clay (pottery).
1926	106,875	551,644	171,232	23,972	195,536	15,643				22,522	85,463	6,135,840	9,273,627	13,680	96,310	11,226	49,504					404,681		2,806 tons	73,721	Soda (trona).
																								8,134 tons	142,289	Talc.
																									3,384,150	Borates, calcium chloride, fuller's earth, magnesite, mineral water, petroleum, potash, silica, tungsten concentrates, zinc.
1927	82,225	447,125	197,132	25,824	125,692	7,919						5,557,339	9,823,839	12,170	92,363	559,011	348,384					311,470		1,798 tons	26,603	Fuller's earth.
																								6,544 tons	49,400	Talc.
																									4,926,551	Borates, calcium chloride, clay (pottery), gems, mineral water, onyx, petroleum, potash, salt, silica, soda (trona), tungsten concentrates.
Totals	$7,758,059	$27,498,537	14,235,526	$2,365,283	6,061,702	$416,331	[2]$10,609,295	[4]167,548	$490,166	151,652	$503,920	38,322,097	$67,071,250	897,570	$1,024,942	1,877,501	$1'930,365	[4]15,009	$125,721	[4]185,388	$343,076	$5,880,591	$130,120		$45,541,228	

[1]Includes crushed rock, rubble, rip rap, sand, gravel.
[2]Combined annual production 1910, 1911, 1912.
[3]See under 'Unapportioned.'

Year	Gold value	Silver, value	Coal		Salt		Magnesite		Brick		Pottery clay		Lime and limestone		Miscellaneous stone[d], value	Mineral water		Miscellaneous and unapportioned		
			Tons	Value	Tons	Value	Tons	Value	M.	Value	Tons	Value	Barrels	Value		Gallons	Value	Amount	Value	Substance
1891																		125,289 lbs.	$27,584	Tin.
1892																		126,000 lbs.	32,400	Tin.
1893	$42,412																			
1894	93,322		7,891	$16,142	1,981	$3,962					3,700	$4,230	24,000	$19,200	$24,000			50 tons	100	Gypsum.
1895	285,106	$2,550	7,950	15,000	4,000	8,000					7,700	9,400	[b]10,000 20,000	10,000 20,000	27,955			18 tons	144	Gypsum.
1898	262,800	13,450	4,982	9,964	4,317	8,634					22,019	22,750	[c]6,000 15,000	6,000 15,000	17,000					
1897	147,227	4,000	6,282	15,705	4,840	9,680					11,700	11,250						6 tons	160	Mineral paint.
1898	189,188	1,384	6,200	15,000	5,000	10,000			560	$5,800	9,500	10,450	8,000	7,000	8,000			10 tons	200	Asbestos.
1899	183,010	2,000	7,905	19,762	3,600	7,200			4,750	39,500	14,900	16,800	13,476	13,476	8,850			30 tons	750	Asbestos.
1900	149,292	6,848	6,000	15,000	4,000	8,000			1,967	28,842	24,560	18,089			57,600			1,000 tons	1,500	Glass sand.
1901	109,747	2,150	2,800	7,000	4,000	12,000			3,201	89,787	30,489	16,624	18,000	18,000	53,400			50 tons	1,250	Asbestos.
1902	47,947	94	1,200	3,000	20,000	20,000			4,153	114,165	34,320	38,920	20,000	17,000	92,998			200 tons	200	Glass sand.
1903	13,453	136			10,000	20,000			3,817	184,020	63,857	65,332	[b]9,000 25,000	8,500 21,250	152,258			110 tons	4,400	Asbestos.
1904	7,488	80			15,000	15,000			4,712	71,380	41,966	49,232	20,000	20,000	415,306			500 tons	500	Glass sand.
1905	35,690	348							2,838	69,195	49,720	67,970	20,000	20,000	360,168			300 tons	3,000	Gypsum.
1906	4,432	251							4,607	92,140	60,123	57,712	14,000	20,000	171,638			100 tons	500	Gypsum.
1907	3,838	26					75	$1,750	3,800	102,000	87,260	174,713	8,000	6,500	571,052			12,000 cu. ft.	1,500	Marble.
1908	5,884	112					2,000	4,000	4,803	74,086	71,231	89,752	[b]8,000 8,300	8,000 8,300	448,478			5,000 cu. ft.	2,500	Marble.
1909	186	24					324	3,888	22,037	265,550	86,028	97,971	3,000	3,000	121,827	30,000	$3,000	20 tons	2,400	Bismuth.
1910	5,585	28					500	4,000	10,267	91,543	101,411	158,844	[d]141,722	120,889	116,357	90,000	9,000	2,500 cu. ft.	2,500	Marble.
1911	[e]20,823	2,121					575	4,800	3,675	28,572	87,295	79,961			474,018	90,580	11,500		2,500	Gems.
1912	20,202	254					878	8,780	2,500	20,000	72,046	93,418	[e]90,831	63,582	587,309	44,256	4,250	3,000 lbs.	3,000	Marble.
1913	12,501	104					569	4,552	3,530	30,300	88,936	89,963			538,844	200,000	20,000	3,000 cu. ft.	9,000	Marble.
1914	10,000	100							1,610	36,713	70,136	69,420			206,802	100,000	2,000	8,971 lbs.	50	Gems.
1915	10,788	1,522							1,055	18,880	59,514	54,840			213,440	200,000	10,000	502 lbs.	100	Copper.
1918	7,855	338					[f]		1,831	28,593	50,228	56,090			159,555	[f]		10 tons	100	Asbestos.
									and tile									22,665 lbs.	2,816	Copper.
1917		[f]					[f]			185,892	70,798	55,491			72,384	[f]		3 tons	300	Asbestos.
1918	392	1,541					[f]			290,540	48,195	80,454			127,962	[f]		400 tons	2,000	Gypsum.
1919	213	415	[f]				[f]			224,379	42,207	61,006			102,399	[f]		8,000 lbs.	1,016	Copper.
1920			[f]							489,209	76,317	126,313			296,499	[f]			877,192	Unapportioned, 1900-1909.
1921			[f]							378,553	84,224	111,219			431,671	56,400	2,945	150 tons	1,500	Mineral paint.
1922										535,772	81,577	181,897			400,560	58,115	18,872		250	Gems.
1923	[f]	[f]								676,584	85,185	246,033			714,899	63,855	5,277		250	Gems.
1924	1,070	581								493,746	121,193	166,692			561,861	78,580	23,021	8,753 lbs.	844	Copper.
1925	3,087	2,570								533,650	74,787	155,316			542,020	[f]		800 tons	3,000	Glass sand
1926	2,931	3,135								610,100	68,628	178,383			1,180,278	[f]			800	Gems.
1927	1,492	1,919								696,795	118,510	198,330			1,244,043	[f]		929 lbs.	42	Lead.
																		6,003 lbs.	990	Copper.
																			3,532,857	Other minerals, 1910-1912.
																		1,000 tons	3,000	Gypsum.
																			1,000	Gems.
																		8,971 lbs.	1,391	Copper.
																			1,372,314	Other Minerals.
																		36,102 lbs.	4,802	Copper.
																		5,350 tons	7,825	Gypsum.
																			1,241,924	Other minerals.
																		3,450 tons	13,650	Gypsum.
																			1,022,814	Cement, potash, silica.
																		32,072 lbs.	1,507	Lead.
																		23,825 lbs.	4,169	Copper.
																		58,617 lbs.	14,420	Copper.
																		8,660 cu. ft.	4,890	Granite.
																		4,220 tons	8,340	Gypsum.
																		350 lbs.	24	Lead.
																		901 tons	1,624	Silica.
																			952,505	Cement, feldspar, magnesite, manganese, mineral water, potash.
																		28,838 lbs.	7,873	Copper.
																		11,097 tons	422,900	Feldspar.
																			3,461	Granite.
																		1,923 tons	3,001	Gypsum.
																		1,157 lbs.	100	Lead.
																		770 tons	2,409	Silica.
																			1,227,073	Cement, fluorspar, gems, magnesite, manganese, mineral water, potash, silver.
																		19,485 lbs.	4,813	Copper.
																		2,288 tons	11,733	Feldspar.
																			3,326	Granite.
																		3,791 tons	152,693	Manganese.
																		1,400 tons	4,800	Silica.
																			1,004,787	Cement, fluorspar, gems, gypsum, lead, magnesite, mineral water, potash.
																		10,580 lbs.	1,970	Copper.
																			17,975	Granite.
																		200 tons	425	Gypsum.
																		1,808 tons	49,324	Manganese ore.
																		3,034 tons	15,112	Silica.
																			2,103,760	Cement, coal, feldspar, fuller's earth, lead, magnesite, mineral water, potash.
																		1,094 tons	6,168	Feldspar.
																			26,408	Granite.
																		3,195 tons	12,581	Silica.
																			4,171,030	Cement, coal, gems, gypsum, mineral water, potash.
																		2,094 tons	14,808	Feldspar.
																			12,852	Granite.
																		1,625 tons	6,357	Silica.
																			3,927,492	Cement, coal, gems, potash.
																		1,087 tons	7,609	Feldspar.
																			30,210	Granite.
																		1,877 tons	11,391	Silica (quartz).
																			2,059,805	Cement, coal, fluorite (optical).
																		5,000 tons	39,000	Feldspar.
																			29,778	Granite.
																		2,300 tons	15,000	Silica (quartz).
																			5,367,282	Cement, coal, gems, gold, gypsum, silver.
																		8,899 lbs.	1,116	Copper.
																		2,205 tons	20,162	Feldspar.
																			17,680	Granite.
																		26,817 lbs.	2,145	Lead.
																		3,160 tons	24,579	Silica.
																			4,195,541	Cement, coal, gypsum, mica schist.
																		23,134 lbs.	3,285	Copper.
																		1,990 tons	16,090	Feldspar.
																			32,234	Granite.
																		135,872 lbs.	11,821	Lead.
																		8,121 tons	84,706	Silica (quartz).
																			3,793,730	Cement, coal, gypsum, mineral water.
																		22,125 lbs.	3,096	Copper.
																		26,140 tons	71,907	Gypsum.
																		173,207 lbs.	13,857	Lead.
																		20,587 tons	72,510	Silica (quartz).
																			4,058,056	Cement, feldspar, mineral water, onyx, slate.
																		19,201 lbs.	2,515	Copper.
																		121,667 lbs.	7,665	Lead.
																		14,262 tons	60,991	Silica.
																			1,244,043	Cement, feldspar, granite, gypsum, lime, mineral water, onyx, zinc.
Totals	$1,658,340	$48,079	[g]51,210	$110,573	78,738	$122,478	[g]4,921	$31,570		$8,468,286	1988,160	$2,912,864		$425,897	$10,479,409	1,011,766	$107,665		$43,324,408	

[a]Riverside County was created March 11, 1893, from portions of San Bernardino and San Diego counties
[b]Includes granite, crushed rock, gravel, sand, paving blocks.
[c]Includes part of Los Angeles County.
[d]Tons of limestone.
[e]See under 'Unapportioned'.

SAN JOAQUIN

Year	Brick		Natural gas	
	M	Value	M cubic feet	Value
1885				
1886				
1894				$75,000
1895				100,000
1896	7,000	$35,000		85,157
1897	5,500	22,000		57,411
1898	6,500	34,000		57,289
1899	5,500	27,000	102,960	84,880
1900	2,000	20,000	27,612	19,862
1901	2,000	20,000		60,456
1902	[2]3,000	[2]18,000	81,481	67,868
1903	[2]4,000	[2]24,000	88,134	44,399
1904	7,500	45,000	106,437	47,635
1905	11,400	68,000	100,950	53,915
1906	7,500	49,500	103,450	55,115
1907	12,250	81,000	101,000	52,723
1908	28,412	189,560	60,903	49,194
1909	8,088	242,634	71,883	149,063
1910	8,744	212,538	313,392	159,451
1911	5,275	49,650		114,433
1912	6,128	64,874		145,166
1913	6,314	73,768	142,730	67,967
1914	5,793	82,890	154,872	25,900
1915	3,000	75,000	161,923	143,974
1916	10,189	158,722	182,441	141,605
1917	also tile	185,060	348,146	72,585
1918		305,475	202,453	60,405
1919		231,478	200,943	76,200
1920		[3]	200,433	74,957
1921		294,712	204,057	79,571
1922		[3]	199,389	62,454
1923		[3]		[3]
1924	14,936	462,688		[3]
1925	also tile	472,983		
1926	also tile	511,448		
1927		630,218		
Totals		$5,087,198		$2,284,635

[1]Production of manganese ore in California began at the Ladd Mine, San Joaquin County, in the Tesla District in 1867. When shipments of this ore to England ceased late in 1874, upwards of 5,000 tons had been produced by that property. Annual amounts earlier than 1894 not separable.

[2]Estimated.

[3]See under 'Unapportioned'.

[4]Includes crushed rock, rubble, rip-rap, sand, gravel.

COUNTY, 1885-1927.

Manganese		Miscellaneous stone[4], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
[1]				$2,500	Gold.
55	$550		275 tons	343	Pottery clay.
280	2,800				
			273 tons	2,730	Asphalt.
			3 tons	90	Infusorial earth.
		25,000			
60	1,080		2,000 tons	13,000	Clay.
				214,835	Unapportioned, 1900-1909.
260	4,160				
			25,510 tons	25,510	Clay.
		900	1,494 tons	18,522	Clay.
			3,000 tons	4,000	Glass sand.
150	1,500	19,440		200	Other minerals.
460	7,400	21,620		400	Other minerals.
6,493	115,460	53,075			
6,320	157,500	55,003		72	Other minerals.
4,281	117,709	47,085		71,299	Gold, platinum, silver.
343	10,274	59,510		71,538	Gold, platinum, silver
[2]		63,077		333,068	Brick, gold, manganese, platinum, silver
425	3,750	72,815		23,530	Other minerals.
[3]		[3]		314,269	Brick and clay.
				96,672	Manganese ore, miscellaneous stone.
		260,597		172,858	Brick and clay.
				77,774	Manganese ore, natural gas.
		83,871		55,938	Manganese ore, natural gas.
		103,237		161,578	Other minerals.
		122,037		207,515	Other minerals.
		81,717			
[5]19,127	$422,183	$1,076,917		$2,162,361	

Year	Bituminous rock		Brick		Chromite		Gold, value	Mineral water	
	Tons	Value	M	Value	Tons*	Value		Gallons	Value
1876[3]									
1877									
1878									
1879									
1880					[2]17,030	$184,704			
1881					1,790	24,000			
1882							$5,000		
1883					5,558	99,200			
1884									
1885					670	8,880			
1886					980	13,140	9,164		
1887	36,000	$180,000			600	7,980	1,740		
1888	43,000	215,000			300	2,550	3,000		
1889					4,300	66,865	6,260		
1890					687	5,496	8,800		
1891					74	592	1,785		
1892							1,097		
1893							600		
1894	9,432	32,263			[4]800	10,500	1,200		
1895	6,354	17,600	750	$3,750	[4]700	6,650	3,000		
1896	5,113	11,464			[4]200	2,000	3,000		
1897	2,291	5,117					2,500	7,800	$1,960
1898	4,788	18,927	830	5,280			1,000	800	400
1899	10,818	40,288	650	3,500					
1900	3,346	12,905	500	4,000					
1901	9,472	33,070	650	5,200			300	24,000	6,000
1902	1,790	2,327	900	7,650			2,399	4,500	800
1903	3,365	7,572	750	6,000			1,840		
1904							630	4,000	1,000
1905	2,533	6,348	400	3,200			300		
1906	2,533	6,644	300	2,400					
1907	2,167	8,128	2,000	16,000			316	4,800	1,000
1908	5,077	21,875	1,440	12,900				4,800	1,056
1909	2,731	6,369	2,245	19,605				4,000	1,000
1910	1,982	4,016	900	8,000				6,000	1,600
1911	2,710	5,230	2,000	18,000				2,000	1,000
1912	807	1,472						2,500	625
1913	609	1,149	1,750	17,500			124	1,500	600
1914	579	1,118						1,000	250
1915	[6]				[6]			4,500	675
1916	[6]		4,150	45,500	1,855	27,733		2,500	475
1917	[6]		[6]		4,109	92,846		1,500	300
1918	[6]				10,443	539,423	[6]	[6]	
1919	[6]				1,158	26,431			
1920					399	10,440			
1921					[6]			[6]	
1922					[6]			[6]	
1923					[6]			[6]	
1924			2,033	35,987				[6]	
1925			[6]		[6]		840	[6]	
1926					[6]			[6]	
1927									
Totals	[6]157,497	$638,882	[6]22,248	$214,472	[6]51,653	$1,129,430	[6]$54,895	[6]76,200	$18,741

*Copper was weighed in tons of 2,360 pounds and chromite in tons of 2,240 pounds, but here converted to 2,000 pounds.

[1]The total production of asphaltum up to 1894 was reported as 800 barrels. This production reduced to tons is shown under 1894.

[2]Although a great deal of chromic iron ore was mined and marketed during the '70's, there are no records of yearly production. The above figure for 1880 represents the total shipments from San Luis Obispo up to August, 1880.

COUNTY, 1876-1927.

Petroleum		Quicksilver		Miscellaneous stone[5], value	Miscellaneous and unapportioned		
Barrels	Value	Flasks	Value		Amount	Value	Substance
----------	----------	6,428	$282,832	----------	*236,000 lbs.	$7,287	Copper.
----------	----------	3,310	123,463	----------	----------	----------	
----------	----------	2,151	70,768	----------	----------	----------	
----------	----------	779	2,358	----------	----------	----------	
----------	----------	----------	----------

	Salt		Brick	
	Tons	Value	M	Value
1895				
1896				
1897				
1898			1,140	$7,000
1899			2,870	24,225
1900			225	9,000
1901	40	$400	500	9,070
1902	6,500	16,000	200	8,000
1903	7,700	25,000	3,100	77,500
1904	12,000	62,500	3,902	56,436
1905	16,000	67,500	5,902	61,436
1906	14,900	44,920	6,613	67,000
1907	14,000	56,000	8,078	86,285
1908	23,800	60,900	4,494	63,231
1909	22,100	95,400	1,346	38,405
1910	26,000	64,750	1,350	37,250
1911	27,500	55,000	1,350	43,000
1912	33,000	80,000	1,400	40,500
1913	28,000	72,250	1,418	44,680
1914	27,500	76,750	950	24,074
1915	25,500	63,750	715	19,550
1916	28,540	70,807	986	38,121
1917	36,483	114,689		
1918	26,434	144,604		
1919	30,238	136,190		
1920	37,409	206,897		
1921	32,587	167,022	[3]	
1922	32,428	149,302		
1923	25,757	199,192		
1924	54,258	205,176		
1925	31,325	155,925		
1926		[3]		
1927		[3]		
Totals	$630,089	$2,360,924	[4]46,539	$754,763

[1]The limestone produced in San Mateo County is used as crushed rock and is included under Stone Industry. Previous to 1915 it was erroneously classified as industrial limestone and tabulated under that heading.

[2]Includes crushed rock, rubble, sand, gravel.

[3]See under 'Unapportioned.'

OUNTY, 1895-1927.

Limestone		Miscellaneous stone[2], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
			5,000 tons	$5,000	Clay.
			1,000 bbls.	1,250	Petroleum.
			500 bbls.	1,250	Cement.
		$40,000			
		70,000			
		34,000			
		7,500			
		6,000	17 tons	255	Asphalt.
		301,120	5,000 tons	5,625	Clay.
		150,000			
		113,866	3,000 bbls.	6,000	Petroleum.
		75,000			
		111,823			
		2,111			
37,687	$17,451	89,142			
120,306	96,245	90,221		500	Gems.
111,382	89,106	88,766			
93,500	74,800	61,185			
102,300	66,495	29,587			
138,544	78,506	18,635		300	Gems.
			81,000 tons	34,120	Sandstone.
153,329	75,941	34,648	6,581 bbls.	845	Lime.
				200	Gems.
[1]		93,391		100	Gems.
				1,100	Other minerals.
		25,663	593 tons	732	Pottery clay.
				85	Gems.
		71,668		150	Gems.
				20,656	Brick and tile, magnesium chloride, potash.
		34,164		15,044	Magnesium chloride, potash.
		42,235		63,246	Other minerals.
		46,040	322 bbls.	966	Petroleum.
				39,200	Magnesium salts, potash.
		61,697	322 bbls.	966	Petroleum.
				27,407	Brick, magnesium chloride, potash.
		60,009		34,984	Magnesium salts, petroleum, potash.
		96,815		33,809	Magnesium chloride, petroleum, potash.
		75,078		21,917	Gems, magnesium chloride, petroleum, potash.
		90,757		1,330,831	Cement, gems, magnesium chloride, natural gas, petroleum, potash.
		77,470		1,816,383	Cement, magnesium chloride, natural gas, petroleum, salt.
[3]		129,802		1,734,036	Cement, limestone, natural gas, petroleum, salt.
757,048	$498,544	$2,227,673		$5,196,857	

SANTA BARBARA COUNTY (see p. 236)
SANTA CLARA COUNTY (see p. 236)

Year	Lime		Limestone	
	Barrels	Value	Tons	Value
1894	167,000	$138,200	4,000	$5,000
1895	145,000	133,750	12,055	12,055
1896	116,000	95,500	27,827	28,663
1897	149,600	111,800	10,688	8,005
1898	151,000	151,000	7,912	5,738
1899	161,893	176,893	4,135	3,730
1900	163,985	131,288	1,669	1,213
1901	161,500	161,500	3,845	3,595
1902	185,223	161,302	1,850	1,850
1903	220,835	185,442	3,000	2,725
1904	293,207	306,775	[2]	
1905	218,084	199,974	7,325	52,125
1906	255,469	347,490	11,431	55,242
1907	213,599	241,179	6,370	6,000
1908	119,996	119,996	1,178	2,167
1909	228,875	296,785	3,457	5,273
1910	214,137	230,513	4,361	6,770
1911	216,508	206,225	22,622	44,591
1912	169,646	159,505	7,307	7,553
1913	75,000	60,000	39,494	30,994
1914	173,282	157,011	14,666	25,082
1915	191,643	177,873	2,047	4,873
1916	176,263	225,485	4,318	9,820
1917	213,104	173,778	6,527	11,378
1918	182,083	285,316	7,132	15,313
1919	150,271	234,039	5,527	12,690
1920	141,633	202,908	5,062	20,101
1921	122,907	242,869	[2]	
1922	174,490	235,802	4,581	20,534
1923	157,660	203,632	6,733	14,242
1924	127,830	212,540	[2]	
1925	16,534	224,724	16,551	33,102
1926	15,457	227,904		
1927	13,431	173,207	16,717	38,045
Totals	5,483,145	$6,358,246	270,387	$685,708

[1]Includes crushed rock, rubble, sand, gravel.
[2]See under 'Unapportioned.'

COUNTY, 1894-1927.

Bituminous rock		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
20,782	$79,980	----	----	----	
32,067	102,486	$4,000	75 M	$375	Brick.
43,843	109,536	4,000	497 M	2,485	Brick.
43,179	123,056	----	300 M	1,500	Brick.
40,598	113,898	----	----	----	
27,503	70,569	200	----	----	
21,960	58,590	----	----	----	
13,580	30,654	----	10 tons	30	Clay.
31,700	41,084	----	106 tons	1,060	Asphalt.
18,426	45,190	20,750	700 cu. ft.	140	Granite.
[2]	----	2,925	----	----	
17,583	42,500	1,750	----	----	
13,544	38,860	3,500	----	----	
21,955	64,707	14,800	----	----	
		19,736	450 cu. ft.	336	Granite
25,041	85,123		28,400 tons	28,400	Clay.
		20,717	63,541 tons	13,800	Clay.
31,392	110,067		----	1,794,294	Unapportioned, 1900-1909.
		23,425	52,970 tons	15,981	Clay.
35,565	124,195		----	2,096,031	Unapportioned.
24,815	80,371	7,627	----	2,448,339	Unapportioned.
32,146	80,439	22,710	----	879,437	Other Minerals.
26,932	67,330	10,511	----	1,647,970	Unapportioned.
40,540	115,500	4,276	----	1,341,089	Unapportioned.
17,399	60,728	6,794	----	1,331,263	Unapportioned.
[2]	----	2,815	----	1,440,991	Cement, marble, bituminous rock.
[2]	----	2,368	----	1,480,800	Cement, potash, bituminous rock.
[2]	----	9,107	----	2,599,717	Cement, potash, bituminous rock.
[2]	----	17,074	----	1,981,253	Other minerals.
[2]	----	23,379	----	2,834,750	Bituminous rock, cement, iron ore, mineral paint, potash.
[2]	----	22,895	----	3,815,121	Bituminous rock, cement, limestone, mineral paint, potash.
[2]	----	7,398	----	3,345,071	Cement, bituminous rock, potash.
[2]	----	15,363	----	3,992,668	Cement, bituminous rock, potash.
[2]	----	29,217	----	4,097,476	Cement, bituminous rock, potash, limestone.
[2]	----	21,125	----	2,948,085	Bituminous rock, cement.
			----	143	Gold.
[2]	----	26,361	----	1	Silver.
			----	3,249,785	Bituminous rock, cement, limestone.
[2]	----	45,570	----	3,216,387	Bituminous rock, cement.
[2]580,550	[2]$2,225,363	$370,393	----	$46,601,688	

SHASTA COUNTY (see p. 237)

SIERRA COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Miscellaneous and unapportioned		
			Amount	Value	Substance
1880	$974,332	$576			
1881	950,000	6,000			
1882	1,100,000				
1883	1,075,000				
1884	1,177,349	145			
1885	1,433,881	11			
1886	1,967,152	2,414			
1887	1,502,469	202			
1888	1,250,000	1,500			
1889	1,446,486	1,222			
1890	733,528	2,039			
1891	701,702	811			
1892	688,464	26			
1893	839,343	46			
1894	604,722				
1895	694,470	107			
1896	786,175	424			
1897	370,208	46			
1898	399,063	519			
1899	450,115	359			
1900	659,696	3,463			
1901	575,427	755			
1902	326,155	311	24,000 gals.	$6,000	Mineral water.
1903	310,770	476			
1904	374,763	1,222			
1905	517,303	3,687			
1906	409,366	2,518			
1907	483,904	2,621	120,000 gals	12,000	Mineral water.
1908	412,626	1,917			
1909	189,672	957			
1910	312,035	1,330			
1911	461,513	5,604			
1912	732,988	2,777	1,285 lbs. 9,919 lbs.	212 446	Copper. Lead.
1913	1,006,573	4,305	2,228 lbs.	98	Lead.
1914	730,000	3,000			
1915	726,362	3,156			
1916	724,256	3,291		1,950	Other minerals.
1917	384,428	1,629	13,031 lbs.	3,558	Copper.
1918	289,368	2,121	807 tons	40,012	Chromite.
1919	301,172	2,957		750	Miscellaneous stone.
1920	442,894	3,967			
1921	612,267	5,236		2,858	Miscellaneous stone
1922	1,753,242	14,484		2,900	Miscellaneous stone
1923	878,161	6,134		2,312	Miscellaneous stone
1924	799,276	5,198		8,000 2	Miscellaneous stone Other minerals.
1925	1,373,705	8,919		3,677	Miscellaneous stone
1926	584,452	2,913		2,150	Miscellaneous stone
1927	678,873	3,350		70,300 10	Miscellaneous stone Other minerals.
Totals	$36,175,709	$114,715		$157,235	

SANTA BARBARA COUNTY—MINERAL PRODUCTION 1881-1927.

Year	Petroleum		Natural gas		Asphalt—bituminous rock		Mineral water		Diatomaceous earth		Brick		Limestone		Lime		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
	Barrels	Value	M cubic feet	Value	Tons	Value	Gallons	Value	Tons	Value	M	Value	Tons	Value	Cubic feet	Value		Amount	Value	Substance
1881																			$2,000	Gold.
1882																				
1889																			41,423	Gold.
1890																			10,293	Gold.
1891																			2,478	Gold.
1892																			896	Gold.
1893																				
1894	1,800	$1,800			4,550	$91,000														
1895	16,904	12,678			23,950	139,000	22,500	$3,000											4,000	Gold.
1896	39,792	35,813			18,430	317,910	31,500	20,300			[3]				5,000	$500		12 ozs.	44	Platinum.
																			8,592	Gold.
1897	130,136	130,136	[2]500	$246	18,047	318,000	65,000	30,000											3,000	Gold.
1898	132,217	112,549	[2]165	135	19,735	351,400	15,000	7,000			100	$700							1,000	Gold.
1899	208,370	191,228	150	120	6,058	121,160	15,000	5,000			120	960								
1900	183,486	165,138	1,203	2,966	5,270	105,500	19,000	10,350			4,620	40,960	7,205	$3,602	224,820	117,260	$82,662			
1901	203,616	113,385	[2]876	438	4,145	55,800	113,780	60,200			1,250	9,825			72,000	27,100	33,400			
1902	230,440	181,313	937	375	1,259	12,590	105,280	60,200	362	$2,172	1,400	12,200	10,000	25,000	74,200	21,500			200	Gold.
1903	262,226	149,640	320	320	2,974	41,688	88,800	22,280	2,700	15,925	4,900	46,200	20,000	40,000	82,654	34,240	4,395	30,000 bbls.	30,000	Lime.
1904	790,000	445,560	3,000	1,500	9,000	190,000	118,000	18,249	6,950	112,282	1,120	8,420	6,000	12,000	5,000	3,800				
1905	3,534,000	1,413,600			3,000	30,000	115,250	21,450	3,000	15,000	4,025	34,750	5,000	7,500	29,600	18,330	57,792	52 flasks	2,070	Quicksilver.
																			725	Gold.
																			2	Silver.
																			250	Gold.
1906	4,876,000	1,237,250	1,000	500	25,000	250,000	13,750	10,450	2,300	13,800	200	1,600	8,000	16 000	36,195	25,230	9,732			
1907	8,392,623	4,166,661	600	300	19,192	258,549	39,480	24,250	2,531	28,948	1,615	14,850	15,000	30,000	39,740	37,566	4,950	60 flasks	2,289	Quicksilver.
1908	8,847,589	4,423,794	715,612	357,806	7,000	70,000	5,500	4,932	2,950	32,012	750	7,500	16,580	33,160	10,525	6,545	10,930			
1909	8,116,788	4,069,661	768,000	394,621	200	2,488	155,400	22,200			990	9,180	4,849	6,619	31,120	10,648	5,316		89,254	Unapportioned, 1900-1909.
1910	7,682,555	3,856,222	9,198,000	1,393,250			155,000	21,500	1,343	14,117	1,900	16,825	4,028	7,898	39,720	15,888	6,035	70 flasks	3,225	Quicksilver.
1911	6,766,156	3,204,717	[2]1,003,860	100,388			73,640	15,900	1,344	13,720	1,600	13,800	4,239	8,174	58,976	29,507	6,602	50 flasks	2,301	Quicksilver.
1912	6,862,719	3,747,045	[2]3,425,000	253,633	11,120	5 556	105,000	11,550	1,129	13,074	2,615	17,150	5,327	11,666	4,500	1,670	17,480	12,000 tons	16,000	Clay.
																		17,500 bbls.	16,434	Lime.
																		12,000 tons	16,000	Clay.
																		26,512 bbls.	25,910	Lime.
1913	6,291,076	3,151,725	5,096,300	254,815	10,000	10,000	112,500	108,130	6,895	28,960	3,000	24,000	5,884	19,623	4,500	1,670	11,450			
1914	4,325,787	1,989,882	6,313,380	378,802	25,000	50,000	160,400	152,432	[2]		2,100	16,800	6,157	11,263	9,286	1,850	15,300		70,000	Other minerals.
1915	5,634,534	3,442.700	3,193,368	279,697			189,026	156,175			1,800	14,400	5,956	10,006	29,900	6,488	13,900		61,600	Other minerals.
1916	4,502,206	3,574,752	3,660,140	724,746	[2]		176,608	110,200	[2]		[2]		[2]		3,520	1,017	12,395		111,919	Bituminous rock, brick, 'granite,' diatomaceous earth, limestone, quicksilver.
1917	5,631,563	4,550,303	3,104,170	227,507			104,991	86,026	[2]		[2]		[2]		28,700	6,150	5,950	97 tons	126,830	Potash.
																			150,315	Brick, diatomaceous earth, limestone, quicksilver.
1918	7,334,104	9,057,618	4,150,316	338,036	[2]		73,117	97,162	[2]		[2]		3,790	18,830	[2]		11,613	1,863 tons	256,780	Potash.
																			271,792	Bituminous rock, chromite, brick, diatomaceous earth, quicksilver, sandstone.
1919	6,089,082	6,850,217	4,084,709	336,092	[2]		82,147	81,041	[2]		[2]		[2]				29,900	298 tons	30,128	Potash.
																			267,539	Bituminous rock, chromite, brick, diatomaceous earth, limestone.
1920	5,803,583	9,140,843	1,359,665	128,126	[2]		95,843	110,931	[2]		[2]				[2]		27,436	410 tons	40,000	Potash.
																			1,091,475	Bituminous rock, brick, diatomaceous earth, quicksilver, sandstone.
1921	5,465 942	9,122,657	1,544,892	145,179	[2]		97,847	133,590	[2]						[2]		65,600	143 tons	5,720	Potash.
																			718,183	Bituminous rock, diatomaceous earth, sandstone.
1922	3,931,155	3,974,398	1,876,900	167,290	[2]		110,552	52,269	[2]		[2]				[2]		72,300		347,101	Bituminous rock, brick, diatomaceous earth, potash, sandstone, shale oil.
1923	3,061,947	2,394,443	1,812,287	172,725	[2]		81,200	80,300	[2]						[2]		14,324		2,344,090	Bituminous rock, diatomaceous earth, sandstone, shale oil.
1924	2,905,181	3,009,768	1,643,355	158,836	[2]		[2]		[2]		[2]		[2]		[2]		75,305		1,915,831	Clay and clay products, bituminous rock, diatomaceous earth, mineral water, shale oil.
1925	2,647,380	2,419.705	2,545,208	248,708			[2]		[2]			75,487					106,665	2,390 tons	5,800	Clay (pottery).
																			1,482,066	Diatomaceous earth, mineral water, shale oil.
1926	1,925,204	1,526,587	2,230,501	246,091	[2]		[2]		[2]			17,076					88,575	1,100 tons	1,700	Clay (pottery).
																			703,519	Bituminous rock, diatomaceous earth, mineral water, shale oil.
1927	2,173,887	1,630,415	1,701,715	204,775	[2]		[2]	[2]			[2]						139,093		725,013	Bituminous rock, brick and hollow building tile, clay (pottery), diatomaceous earth, mineral water, sandstone, shale oil.
Totals	125,000,048	$93,493,973	59,236,129	$6,518,021	[3]213,930	$2,420,641	2,541,111	$1,537,067	[3]31,504	$290,010	...	$382 483	[3]128,015	$261,341	[3]789,956	$366,759	929,100		$11,005,787	

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]See under 'Unapportioned.'
[3]Quantity estimated, as only value originally reported.

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Totals	

Year	Brick		Chromite		Copper		Gold, value	Lime		Limestone		Mineral water		Pyrites		Silver, value	Miscellaneous and unapportioned		
	M	Value	Tons	Value	Pounds	Value		Barrels	Value	Tons	Value	Gallons	Value	Tons	Value		Amount	Value	Substance
1880							$140,455									$117,907			
1881							350,000									85,000			
1882							300,000									80,000			
1883							210,000									20,000			
1884							320,000									30,000			
1885							417,004									9,223			
1886							699,508									10,647			
1887							627,681									40,204			
1888							660,000									50,000			
1889							415,631									5,396			
1890							420,530									7,279			
1891							554,063									7,432			
1892							574,833									7,977			
1893							500,407									8,577			
1894			1,200	$16,800			617,436					150,000	$75,000			5,032	200 tons	$1,500	Iron ore.
1895			90	1,120			718,696									28,417			
1896	300	$1,500			1,847,067	$184,708	599,209	2,310	$2,541							24,233		1,400	Stone industry.
1897	1,200	7,200			13,592,610	1,535,966	569,071	2,100	2,100	9,000	$13,500					96,869			
1898	1,200	7,200			21,442,000	2,465,830	860,180	2,500	3,750			3,000	2,000			171,768			
1899	2,000	14,000			21,835,863	3,565,023	873,719	8,000	10,000	250	375	5,000	1,850			196,213	100 sq'rs	800	Slate.
																		375	Stone industry.
1900	2,000	12,000	140	1,400	25,736,473	4,166,735	733,467	17,850	17,850	1,150	1,150	9,640	5,784			635,640			
1901	3,000	12,000	130	1,950	30,990,781	4,881,048	927,975	21,600	12,960			26,295	7,644			691,994		2,000	Stone industry.
1902	2,450	12,250	315	4,275	21,515,887	2,496,731	878,706	18,500	12,500	3,500	3,600	26,205	7,645	3,202	$7,005	306,887			
1903	3,500	17,500	150	2,250	16,453,409	2,171,497	771,242	27,000	10,800	5,400	5,400	40,000	12,000	2,500	5,500	203,091		1,500	Stone industry.
1904	3,000	15,000	98	1,470	26,438,145	3,439,974	1,031,429	18,000	10,500							399,660		47,723	Unapportioned, 1900-1909.
1905	3,500	14,000	20	300	10,830,865	1,688,614	684,952	10,700	8,000	3,600	3,600	80,000	12,000			167,548			
1906	4,400	22,000	80	1,200	22,477,304	4,338,121	819,144	12,860	8,040	27,000	32,960			32,689	89,895	434,483			
1907	4,500	33,000	260	5,200	27,844,364	5,568,873	791,997	29,222	31,900	30,761	30,761			65,788	197,364	370,211	400 tons	400	Iron ore.
1908	2,000	12,000	280	5,600	34,878,677	4,642,976	1,131,832	11,818	9,100	80,000	80,000	100,000	20,000	93,677	539,553	517,596		25,000	Stone industry.
1909	3,500	23,500	205	3,517	58,665,447	7,581,115	1,600,489	8,650	8,000	129,560	134,595	100,000	20,000	449,762	1,349,286	735,460	108 tons	174	Iron ore.
																		4,688	Stone industry.
1910	2,425	17,548	680	9,155	44,947,950	5,725,469	1,533,728	16,616	14,114	117,109	117,083	40,000	10,000	31,683	126,692	648,905	570 tons	900	Iron ore.
																	1,850 lbs.	83	Lead.
1911	2,825	20,094	875	13,697	29,539,913	3,692,489	[1]1,050,881	13,271	10,164	67,924	65,253	25,000	6,250	47,885	151,602	386,991	881 lbs.	40	Lead.
1912	1,697	10,195	1,000	8,000	25,249,892	4,166,232	986,803	6,529	3,548	58,022	45,575	23,225	5,646	62,605	174,402	425,382			
1913	360	4,330	280	2,800	27,686,436	4,291,708	1,208,870	8,595	7,030	41,346	35,616	30,000	6,850	72,071	194,406	448,031	47 tons	1,175	Asbestos.
																	19,070 lbs.	839	Lead.
																		10,686	Other minerals.
																	1,436 tons	5,128	Iron ore.
1914	1,594	10,223	867	4,884	25,122,766	3,341,328	1,101,202	8,057	5,163	36,997	30,026	30,000	6,850	69,438	195,362	346,706	21,565 lbs.	641	Lead.
																		125	Miscellaneous stone.
																	180,936 lbs.	8,504	Lead.
																		1,416	Miscellaneous stone
1915	1,836	11,550	1,757	17,570	30,828,917	5,395,060	1,120,848	"		44,953	40,945	12,000	1,800	"		459,566	8,378,401 lbs.	1,038,922	Zinc.
																		253,950	Iron ore, pyrites, lime.
																	478,560 lbs.	33,021	Lead.
																		57,303	Lime and limestone.
191	"		12,425	181,225	39,437,196	9,701,550	936,885	"		"		"		"		1,115,471	9,484,800 lbs.	1,270,963	Zinc
																		800	Miscellaneous stone.
																		342,290	Asbestos, brick, iron ore, manganese, mineral water, platinum, pyrites, silica.
																	8,725 lbs.	750	Lead.
																		78,101	Lime and limestone.
1917	"		3,116	68,479	28,000,990	7,646,727	775,125	"		"		"		"		820,703	14 ozs.	1,100	Platinum.
																		800	Miscellaneous stone.
																	8,281,510 lbs.	844,715	Zinc.
																		308,360	Cadmium, brick, iron ore, mineral water, molybdenum, pyrites, silica.
																	492,565 lbs.	34,972	Lead.
																	35 ozs.	2,700	Platinum.
1918	"		1,423	70,214	25,294,590	5,247,764	513,509			45,671	72,410			"		420,410		7,000	Miscellaneous stone.
																	3,045,692 lbs.	277,158	Zinc.
																		422,525	Cadmium, brick, iron ore, lime, mineral water molybdenum, pyrites.
																		29,100	Lime and limestone.
1919	"				8,673,342	1,613,242	378,283	"		"		"		138,040	497,398	165,802	121 fine ozs	21,075	Platinum.
																		31,750	Miscellaneous stone.
																		40,153	Barytes, brick, iron ore, lead, mineral water, zinc
																	64,400 lbs.	6,152	Lead.
																	158 fine ozs.	27,004	Platinum.
1920	"				810,843	149,195	312,901							135,390	475,330	36,563		32,050	Miscellaneous stone.
																		69,743	Asbestos, brick, iron ore, lime, limestone, zinc.
																	219 fine ozs.	26,817	Platinum.
1921					437,593	56,449	267,681	"		"				"		5,581		31,945	Miscellaneous stone.
																		452,589	Asbestos, barytes, iron ore, lead, pyrites, zinc
																	406 fine ozs.	57,458	Platinum.
1922					1,827,875	246,763	393,034							"		26,901		65,525	Stone, miscellaneous.
																		723,910	Asbestos, barytes, iron ore, lead pyrites, zinc
																	328,115 lbs.	22,968	Lead.
1923					3,437,963	605,381	350,487			"				"		47,706	209 fine ozs.	43,326	Platinum.
																		86,500	Stone, miscellaneous.
																		408,019	Asbestos, barytes, iron ore, lime, limestone, pyrites.
																	6,615 lbs.	520	Lead.
																	27 fine ozs.	3,361	Platinum.
1924					21,109,958	2,765,405	346,622			28,097	36,480			"		313,402		587,637	Stone, miscellaneous.
																		671,228	Asbestos, coal, diatomaceous earth, iron ore, pyrites, zinc.
																	617,886 lbs.	56,366	Lead.
																	8 fine ozs.	725	Platinum
1925					11,565,967	2,068,367	235,013			24,395	28,480			"		208,818		319,617	Miscellaneous stone
																	11,090,430 lbs	812,873	Zinc
																		510,190	Chromite, [2]diatomaceous earth iron ore pyrite, talc
																	15,584 lbs.	1,247	Lead.
																	28 fine ozs	3,034	Platinum.
1926					5,113,111	715,836	132,906							"		110,719		162,355	Miscellaneous stone.
																	17,757,000 lb.	1,331,775	Zinc
																		128,272	Coal, diatomaceous earth, iron ore, limestone, pyrite, talc.
																	1,730 lbs.	112	Lead.
																	25 fine ozs.	2,552	Platinum
1927					4,524,906	592,763	191,900			"				"		70,261		124,678	Miscellaneous stone.
																		957,822	Diatomaceous earth, limestone, pyrite, talc, zinc.
Totals	47,287	$277,090	25,391	$421,106	671,168,123	$107,758,939	$31,624,334	241,778	$188,060	711,064	$715,399	700,455	$201,319	1,205,645	$4 003,798	$11,453,562		$13,400,804	

[1]Dredge production included under Stanislaus County.
[2]See under 'Unapportioned.'

Year	Quicksilver		Mineral water		Petroleum		Brick		Pottery clay		Sandstone		Limestone		Miscellaneous stone, value	Magnesite		Miscellaneous and unapportioned		
	Flasks	Value	Gallons	Value	Barrels	Value	M	Value	Tons	Value	Cubic feet	Value	Tons	Value		Tons	Value	Amount	Value	Substance
1850	7,723	$768,052																		
1851	27,779	1,859,248																		
1852	15,901	927,505																		
1853	22,284	1,235,648																		
1854	30,004	1,663,722																		
1855	29,142	1,560,554																		
1856	27,138	1,401,678																		
1857	28,264	1,374,381																		
1858	25,761	1,232,149																		
1859	1,294	81,630																		
1860	7,061	378,117																		
1861	34,429	1,447,739																		
1862	39,671	1,442,041																		
1863	32,803	1,380,350																		
1864	42,489	1,950,245																		
1865	47,194	2,166,205																		
1866	35,150	1,867,519																		
1867	24,461	1,122,760																		
1868	25,628	1,176,325																		
1869	16,898	775,618																		
1870	14,423	827,592																		
1871	18,568	1,171,641																		
1872	18,574	1,224,584																		
1873	11,042	857,094																		
1874	9,084	395,455																		
	20,000	1,098,000																		
1875	16,980	1,428,867																		
1876	27,930	1,228,920																		
1877	30,237	1,127,840																		
1878	24,924	820,000																		
1879	36,054	1,076,212																		
1880	30,135	934,185																		
1881	31,288	933,321																		
1882	29,208	824,542																		
1883	29,084	836,165																		
1884	20,000	610,000																		
1885	21,400	658,050																		
1886	18,000	639,000																		
1887	20,000	847,800																		
1888	18,000	765,000																		
1889	13,100	589,500																		
1890	12,000	630,000																		
1891	8,200	371,105																		
1892	5,563	226,470																80,000 cu. ft.	$4,072	Natural gas.
1893	5,614	243,064																		
1894	7,235	222,169	5,000	$1,250	3,500	$8,500	22,725	$119,250			24,000	$8,292						800,000 cu. ft.	12,000	Natural gas.
1895	7,050	253,800	20,000	5,000	4,000	10,000	24,750	131,250							$33,900					
1896	6,222	211,570	44,000	18,800	900	1,145	15,000	80,000					500	$600	5,000				1,300	Natural gas.
1897	4,700	169,200	39,500	17,600	4,000	10,000	19,000	105,000												
1898	5,875	235,000	25,863	11,358	3,000	6,000	13,098	65,490	200	$2,500					12,000			32 tons	640	Asphalt.
1899	4,435	186,270	79,000	19,150	1,500	3,000	30,741	170,455					1,800	3,000	8,000	100	$1,350	5 tons	75	Manganese.
1900	5,145	241,073	30,000	8,060			20,000	138,000	2,000	6,000	120,000	100,000	8,000	6,000		39	253			
1901	5,220	236,808	55,000	8,500			21,800	94,570			60,000	80,000			917	50	300	17 tons	255	Asphalt.
1902	5,869	254,260	21,900	5,500			23,982	178,862			35,000	31,500						2,000 cu. ft.	1,200	Granite.
																		21 tons	47	Bituminous rock.
1903	5,803	233,130	50,000	12,500	4,695	3,966	28,069	188,284			112,350	225,000	7,000	7,000	100			11 tons	132	Asphalt.
1904	3,889	148,103	50,000	12,500	42,000	13,860	24,909	178,581							12,000					
1905	2,693	95,968	5,000	1,200	41,000	14,555	28,486	204,357	700	1,050	100,000	150,000			3,000					
1906	2,592	94,608	5,000	1,250	7,000	2,800	23,397	183,676	1,000	1,500			10,000	15,000						
1907	2,518	96,086	11,374	2,187	22,100	5,525	30,053	255,424			3,500	3,500	9,460	16,694		[3]3,700	33,300			
1908	2,460	103,984	371,635	39,955	35,400	17,700	15,000	63,618					671	1,417	45,142	[2]2,000	24,000	10,017 bbls.	10,017	Lime.
																		1,000 bbls.	1,000	Lime.
1909	3,747	158,490	373,367	40,754	63,780	76,538	6,000	30,000					2,221	4,150	75,916	300	3,000		82,254	Unapportioned, 1900-1909.
1910	4,038	182,719	182,500	11,200	38,680	36,860	12,000	66,000	12,000	66,000			4,284	3,451	68,765	7,560	51,937			
1911	7,533	346,593	165,720	10,000	12,828	8,505	6,000	30,000					2,417	3,918	62,595					
1912	8,695	385,538	152,500	10,250	14,092	8,295	18,000	105,000					3,374	4,120	48,228	600	3,000	13,508 bbls.	10,154	Lime.
																		13,107 bbls.	9,783	Lime.
1913	3,709	149,213	101,000	10,750	20,000	12,000	18,000	95,000					3,549	4,200	29,377	70	560	2,000 cu. ft.	500	Natural gas.
1914	2,407	118,063	29,000	10,750	10,000	5,300	15,900	79,500							39,093	1,425	14,250			
1915	4,386	376,319	38,400	16,770	16,617	11,067	10,096	57,784							98,342	7,823	74,607		340	Other minerals.
1916	4,016	375,496	50,000	11,300	16,368	10,901	13,100	82,800	2,024	2,293			[2]		111,974	23,207	232,156		25,028	Chromite, limestone, manganese.
1917	5,921	639,594	10,230	1,923	18,855	26,152	14,000	80,000	6,014	4,929			[2]		111,304	9,903	99,237		28,341	Chromite, manganese, tile, limestone.
1918	3,977	478,524	13,025	1,678	20,499	34,848	6,792	82,000							111,860	9,748	121,872		948,786	Chromite, manganese, clay, tile, potash.
1919	3,012	271,782	[1]		16,724	26,695	7,250	65,000	2,532	2,232			[2]		73,237	10,912	128,924		480,721	Manganese, limestone, mineral water, potash.
1920	2,893	233,199	3,360	480	18,095	23,901	11,890	164,380	1,900	4,600			[2]		129,582	26,812	392,580		89,870	Limestone and potash.
1921	[1]		2,500	275	13,964	26,943	7,501	110,961	1,126	2,300			[2]		138,584	25,800	280,000		191,645	Limestone marl, potash, quicksilver.
1922	[1]		3,500	325	[1]		11,409	150,057	3,836	7,372			[2]		235,125	28,650	301,875		199,282	Limestone (marl), petroleum, quicksilver.
1923	[1]		[1]		[1]		22,514	282,997	2,202	3,954			8,252 also marble	49,512	314,935	36,390	472,620		196,375	Mineral water, natural gas, petroleum quicksilver.
1924	[1]		[2]		14,417	20,481	24,271	217,172	5,341	5,666			[2]		259,023	[2]			648,059	Limestone, magnesite, mineral water, natural gas, quicksilver.
1925	[2]		[2]		13,828	22,594	24,250	251,059	1,516	3,216			[2]		453,273	[2]			590,718	Limestone, magnesite, mineral water, natural gas, quicksilver.
1926	[2]		[2]		[2]										478,231	[2]			197,998	Clay and clay products
																			352,277	Magnesite, mineral water, natural gas quicksilver, petroleum.
1927			[2]		11,994	14,212	20,254	189,472	4,373	4,261					457,703	[2]			315,228	Magnesite and mineral water.
Totals	1,151,176	$54,283,002	1,938,374	$291,315	485,816	$462,141	590,237	$4,284,099	46,764	$117,873	454,850	$598,292	59,528	119,062	$3,417,206	183,837	$2,109,967		$4,380,025	

[1] Includes crushed rock, rubble, sand, gravel.
[2] See under "Unapportioned."
[3] Estimated production of Guadalupe Mine previous to 1875.
[4] Erroneously credited to Alameda County in reports of those years.

Year	Gold, value	Silver, value	Chromite		Mineral water	
			Tons	Value	Gallons	Value
1880	$440,735	$95,340				
1881	850,000	1,500				
1882	720,000					
1883	400,000					
1884	475,000					
1885	338,659					
1886	342,677	64				
1887	606,859	177				
1888	625,000					
1889	915,294	370				
1890	860,303	23				
1891	957,220	120				
1892	1,013,332	56				
1893	799,108					
1894	760,782					
1895	950,006	177			200,000	$80,800
1896	1,091,265	653			[3]	
1897	842,123	34			[3]	
1898	768,804	321			[3]	
1899	991,771	100			[3]	
1900	951,397	[2]6,700			700,000	45,000
1901	886,043	[2]2,980			700,000	175,000
1902	906,989	233			750,000	187,500
1903	613,576	22			750,000	50,000
1904	892,685	1,230			750,000	50,000
1905	803,035	2,499			[3]	
1906	[3]	[3]			[3]	
1907	398,017	3,037			725,000	36,250
1908	504,156	6,125			700,000	80,000
1909	416,160	2,145			500,000	10,000
1910	437,376	2,322			500,000	60,000
1911	422,297	2,561			700,000	120,000
1912	472,314	2,980	220	$2,310	700,000	120,000
1913	[4]180,125	[4]1,228			700,000	120,000
1914	312,842	1,026			650,000	65,000
1915	426,716	2,081	[3]		626,680	62,990
1916	441,307	2,312	2,251	28,731	502,650	50,530
1917	325,550	16,883	2,046	49,797	503,000	50,600
1918	294,227	14,501	6,612	336,588	501,750	50,175
1919	226,525	17,049	510	13,379	451,500	90,375
1920	80,707	5,218	215	5,732	300,150	60,015
1921	42,635	294	[3]		250,150	5,015
1922	75,105	612				
1923	45,633	298			200,150	4,042
1924	63,570	296				6,100
1925	180,120	831			[3]	
1926	141,240	709			[3]	
1927	138,822	586			[3]	
Totals	$5,428,107	$195,693	[1]11,854	$436,537	[2]12,361,030	$1,579,392

[1]Includes crushed rock, rubble, rip-rap, sand, gravel.
[2]Recalculated to 'commercial,' from 'coining value' as originally published.
[3]See under 'Unapportioned.'
[4]Production from dredging operations included in Stanislaus County production.

COUNTY, 1880-1927.

Platinum group metals		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Ounces	Value		Amount	Value	Substance
100	$600				
				$1,202,742	Unapportioned, 1900-1909
			200 lbs.	23	Copper.
1.6	21				
5.3	93		2,500 cu. ft.	1,250	Sandstone.
			2,500 cu. ft.	1,500	Sandstone.
			193 lbs.	39	Copper.
			2,643 lbs.	140	Lead.
		$39,000	11,433 cu. ft.	12,897	Sandstone.
			1,000 bbls.	1,000	Lime
			220 tons	300	Limestone.
			4,949 lbs.	1,183	Lead.
			1,800 cu. ft.	1,485	Sandstone.
			1,090 lbs.	1,680	Lime.
			3,360 lbs.	144	Lead.
			50 tons	500	Pumice
		5,028	1,050 cu. ft.	1,750	Sandstone.
			100 bbls.	300	Lime.
			2,225 tons	2,200	Limestone.
				14,745	Gems.
			1,204 cu.ft.	2,000	Sandstone.
		9,475	335 bbls.	735	Lime.
			35 tons	525	Limestone.
				1,000	Gems.
			150 bbls.	120	Lime.
		6,580	24 tons	24	Limestone.
			650 cu. ft.	455	Sandstone.
			250 cu. ft.	250	Sandstone.
		609		250	Gems.
				250	Gems.
		4,883	90 tons	2,000	Pumice.
				1,500	Other minerals.
			100 tons	500	Coal.
9	304	5,371	58 lbs.	2	Lead.
			677 bbls.	629	Lime.
			250 cu. ft.	150	Sandstone.
			188 lbs.	9	Lead.
		4,630	745 bbls.	745	Lime.
				16,923	Chromite, copper, marble, sandstone.
[2]		45,407		12,609	Copper, building stone, lime, platinum, sandstone
				500	Granite.
15	709	134,382	888,043 lbs.	242,436	Copper.
			192 lbs.	17	Lead.
				8,535	Lime, sandstone, soda.
1	58	24,588	573,593 lbs.	141,677	Copper.
				15,473	Lead and pumice.
7	1,015	26,405		111,294	Copper, limestone, pumice, quicksilver.
		30,322		47,121	Copper, lime, limestone, potash, pumice, quicksilver
[2]		44,343		1,060	Asbestos, brick, chromite, lime, platinum.
		21,726		4,020	Other minerals.[5]
3	339	129,291		1,408	Other minerals.[6]
		67,787		3,034	Other minerals.[7]
[2]		23,800		3,535	Lime and limestone.
				11,340	Mineral water, platinum, sandstone.
16	1,780	327,569		22,853	Coal, lead, mineral water, sandstone.
10	690	102,428		56,420	Mineral water, sandstone.
167.9	$5,609	$1,013,624		$1,955,277	

[5]Includes limestone and mineral water.
[6]Includes lead and lime.
[7]Includes coal, limestone, lime and platinum.

SOLANO

Year	Quicksilver		Mineral water		Lime and limestone	
	Flasks	Value	Gallons	Value	Tons	Value
1873	1,800	$144,594				
1874	1,900	199,842				
1875	2,100	176,715				
1876	1,683	74,052				
1877	1,463	54,570				
1878	802	26,386				
1879	1,290	38,507				
1880	492	15,252				
1881						
1882						
1883						
1884						
1885						
1886						
1887						
1888						
1889						
1890						
1891						
1892						
1893						
1894					6,400	$8,000
1895					4,300	4,635
1896			3,094	$1,547	5,477	5,989
1897					9,608	9,801
1898					6,125	5,570
1899			20,000	4,000		356
1900			20,000	4,000	1,800	1,800
1901			17,800	4,450		5,950
1902	42	1,890	10,000	4,000		
1903	100	4,100	10,000	4,000		
1904	[2]377	15,080	10,000	4,000		
1905	542	18,518	10,000	4,000	100,000	100,000
1906	528	19,272	4,000	4,000		
1907	640	24,422	40,000	4,000		
1908	764	33,294	140,000	11,600		
1909			32,650	5,490		
1910			32,400	3,960		
1911			30,000	4,000		
1912			285,050	44,000		
1913			23,600	3,440		
1914	320	15,696	43,020	5,208	86,128	86,128
1915	[3]		64,200	8,000		
1916	660	61,710	11,200	3,750		
1917	554	52,765	10,960	2,580		
1918	593	59,122	11,440	2,722		
1919	[3]		[3]			
1920	[3]		[3]		[3]	
1921			[3]			
1922			[3]			
1923	[3]		[3]			
1924			[3]			
1925			[3]			
1926			[3]			
1927			[3]			
Totals	[1]16,650	$1,035,787	[3]$29,324	$132,747	[3]219,838	$228,229

[1]Includes crushed rock, rubble, paving blocks, sand, gravel.
[2]Flasks of 75 pounds since June, 1904; 76½ pounds previously.
[3]See under 'Unapportioned.'

COUNTY, 1873-1927.

Miscellaneous stone[1], value	Natural gas, value	Miscellaneous and unapportioned		
		Amount	Value	Substance
$225				
19,650				
15,752		75 tons	$125	Pottery clay
20,975		400 tons	500	Pottery clay
15,065				
12,181				
18 900				
2,200				
14,250		75,000 bbls.	150 000	Cement.
21,514		250,000 bbls.	375,000	Cement
11,113				
78,573				
143,487				
202,146	$6,584	125 tons	600	Salt.
		3,000 M	25,000	Brick.
527,319	8,053	400 tons	2,800	Salt.
		1,000 M	7 000	Brick.
		100 tons	200	Salt.
176,813	7,538	1,600 M	20,000	Brick.
		5,600 tons	11,200	Clay.
241,949	9,100	50 tons	150	Salt.
181,952	8,596	100 tons	300	Salt.
		500 M	4,000	Brick.
130.445	8,528	50 tons	100	Salt.
		2,200 M	20,000	Brick.
28,915	7,366		13,570,019	Unapportioned, 1900-1913, inclusive.
71,288	5,546		1,500,000	Other minerals.
37,576	[3]		1,290,347	Cement, fuller's earth, natural gas, quicksilver, salt.
49,711	[3]		1,090,164	Cement, natural gas, salt.
39,826	[3]		1,804.060	Cement, fuller's earth, natural gas, salt.
30,124	[3]		1,378,758	Cement, fuller's earth, natural gas, onyx, salt.
44,156	[3]		1,627,928	Cement, fuller's earth, mineral water, natural gas, quicksilver.
[3]	[3]		2,930,614	Cement, limestone, onyx, mineral water, natural gas, quicksilver miscellaneous stone.
60,604			2,969,594	Cement, mineral water, onyx.
103,394			3,004,720	Cement, mineral water, onyx.
113,545			3,263,340	Cement, mineral water, onyx, quicksilver.
117,475			2,972,000	Cement, mineral water, onyx.
145,484			2,678,547	Cement, mineral water, onyx.
			1,770,820	Onyx, travertine, cement, mineral water.
[3]			1,557,840	Cement, clay (pottery), mineral water, miscellaneous stone, travertine.
[3]$2,677,007	[3]$61,311		$3,328,660	

SONOMA

Year	Quicksilver		Mineral paint		Brick	
	Flasks	Value	Tons	Value	M	Value
1873	50	$4,017				
1874	1,700	178,806				
1875	1,218	102,495				
1876	3,897	171,468				
1877	3,609	134,616				
1878	3,255	106,890				
1879	2,977	88,923				
1880	1,445	44,795				
1881	1,273	37,974				
1882	2,124	59,960				
1883	1,669	47,984				
1884	332	10,126				
1885	446	13,715				
1886	735	26,093				
1887	689	29,196			1,000	$5,000
1888	1,151	48,918			1,000	5,000
1889	1,345	60,525				
1890	1,046	54,915				
1891	1,660	75,115				
1892	1,630	66,357				
1893	1,445	53,104				
1894	1,368	41,998	100	$3,500	375	1,875
1895	1,813	70,707	225	3,375	350	1,750
1896	1,126	37,150	220	3,740	250	1,250
1897	1,538	59,982	270	3,780	[1]300	1,500
1898	1,704	63,048			350	2,800
1899	2,119	105,950			200	1,800
1900	2,209	99,500			280	2,360
1901	2,130	95,850			150	1,200
1902	1,440	64,685	30	105	150	1,200
1903	2,404	98,676	800	320	160	1,440
1904	[4]2,700	102,829			175	1,750
1905	2,504	97,041			500	4,000
1906	2,070	75,555			6,800	115,000
1907	560	21,369			11,600	133,479
1908	590	24,939			11,000	83,000
[1]909	344	14,226			6,500	29,000
1910	260	11,765				
1911	94	4,325				
1912	646	27,158				
1913	12	48				
1914	13	638				
1915	159	21 793				
1916	1,039	9[illegible]14				
1917	2,592	2[illegible]4 81				
1918	2,417	28[illegible]3				
1919	1,418	115 142				
1920	[5]					
1921	[5]					
1922	[5]					
1923	528	31,147				
1924	867	60,840				
1925	351	29 134				
1926						
1927	373	43,068				
Totals	571,164	$3,461,279	1,645	$14,820	41,140	$393,404

[1]Includes crushed rock, rubble, rip-rap, paving blocks, sand, gravel.
[2]Eleventh Census Report, Vol. X, Part 3, p. 605.
[3]Estimated.
[4]Flasks of 75 pounds since June, 1904. Previously 76½ pounds.
[5]See under 'Unapportioned.'
[6]There was a considerable production of paving blocks in Sonoma County in the 70's and '80s, but no available records of annual amounts or values.

COUNTY, 1873-1927.

Mineral water		Miscellaneous stone[1], value	Magnesite		Miscellaneous and unapportioned		
Gallons	Value		Tons	Value	Amount	Value	Substance
----------	----------	[5]	----------	----------	----------	----------	
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----------	----------	$350,000	----------	----------	----------	----------	
----------	----------	367,500	----------	----------	----------	----------	
----------	----------	[2]297,236	----------	----------	----------	----------	
----------	----------	[3]245,000	----------	----------	----------	----------	
----------	----------	[3]150,000	----------	----------	----------	----------	
----------	----------	96,000	----------	----------	----------	----------	
----------	----------	92,800	----------	----------	----------	----------	
----------	----------	57,381	----------	----------	----------	----------	
8,000	$32,500	69,508	----------	----------	----------	----------	
14,400	19,287	73,719	----------	----------	----------	----------	
236,000	24,000	33,035	----------	----------	----------	----------	
246,680	23,490	43,371	----------	----------	----------	----------	
21,000	18,500	16,830	----------	----------	----------	----------	
575,000	35,000	20,275	----------	----------	----------	----------	
60,900	17,691	52,701	175	$1,225	64 tons	$4,460	Graphite.
30,000	9,100	121,578	130	455	42 tons	1,680	Graphite.
10,000	4,000	90,933	----------	----------	----------	----------	
11,000	4,400	75,947	----------	----------	1,500 bbls.	2,250	Lime.
10,000	4,000	213,830	----------	----------	----------	----------	
10,000	4,000	158,218	----------	----------	----------	300	Gems.
12,000	4,200	132,946	250	1,250	1,500 bbls.	2,600	Lime.
					----------	50	Gems.
					10,500 tons	10,700	Clay.
10,000	1,000	307,695	15	180	2,600 tons	3,000	Clay.
104,000	21,350	319,716	----------	----------	500 tons	5,500	Clay.
					----------	15,000	Unapportioned, 1900-1909.
235,000	50,350	220,998	----------	----------	----------	----------	
202,500	50,250	184,035	----------	----------	----------	1,000	Unapportioned.
62,500	20,950	295,198	300	3,000	----------	----------	
96,240	46,910	191,436	----------	----------	----------	----------	
80,015	46,160	276,516	213	2,130	----------	700	Other minerals.
258,600	41,231	177,917	3,624	34,788	----------	375	Other minerals.
121,366	28,031	232,113	11,653	98,280	243 tons	2,478	Chromite.
					----------	14,000	Building stone, manganese.
					226 tons	6,200	Chromite.
121,290	35,031	146,621	5,636	61,335	362 tons	12,689	Manganese.
					----------	64	Other minerals.
					1,540 tons	73,906	Chromite.
83,220	36,050	148,347	4,110	40,010	173 tons	7,645	Manganese.
					----------	100	Other minerals.
96,800	22,820	144,014	----------	----------	----------	62	Building stone, curbing
29,928	6,578	217,667	[5]	----------	----------	63,000	Magnesite, quicksilver.
37,641	9,891	151,300	[5]	----------	----------	14,360	Gems, magnesite, quicksilver
35,843	9,108	162,679	----------	----------	----------	50,154	Pottery clay, gems, quicksilver.
30,661	7,106	189,059	----------	----------	----------	----------	
31,003	8,002	101,009	----------	----------	----------	2,200	
17,713	6,679	119,546	----------	----------	----------	4,872	Pottery clay, building stone, manganese.
36,272	7,752	208,479	----------	----------	----------	6,355	Pottery clay, gems, manganese ore, petroleum, quicksilver.
25,428	5,889	208,753	----------	----------	----------	7,682	Petroleum, sandstone.
2,961,000	$661,306	$6,761,906	[5]25,236	$242,653	----------	$313,382	

STANISLAUS

Year	Gold, value	Silver, value	Brick		Magnesite		Manganese	
			M	Value	Tons	Value	Tons	Value
1880	$73,271							
1881	63,000	$31,000						
1882	80,000	15,000						
1883	40,000	5,000						
1884	40,000	5,000						
1885	18,660							
1886	47,175							
1887	53,297							
1888	75,000							
1889	20,410							
1890	5,335							
1891	3,000							
1892	14,191							
1893	150							
1894	26,369							
1895	26,482							
1896	16,635							
1897	37,392							
1898	19,400							
1899	10,000							
1900	[1]21,212							
1901	[1]15,700				100	$600		
1902								
1903	[1]52,869	256						
1904	[1]50,000	265						
1905	[1]50,000	240						
1906	[3]	[3]						
1907	3,364	28						
1908	[2]	[2]	750	$7,000				
1909	[2]	[2]	5,000	50,000				
1910	[1]214,187	[1]604	1,500	8,000				
1911	[4]307,538	[4]1,131	850	5,950				
1912	[1]226,163	[1]1,974	250	2,000				
1913	[5]253,166	[2]671	300	2,400				
1914	[2]	[2]	250	2,500				
1915	[3]	[3]						
1916	[3]	[3]	[3]				160	$2,400
1917	[3]	[3]			3,196	44,350	775	26,925
1918	14,196	592			2,024	18,038	5,753	222,422
1919	[3]	[3]			2,031	20,831	8,921	374,584
1920	142,467	775			4,064	39,435	893	12,973
1921	18,439	136			3,378	33,158	[3]	
1922	[3]	[3]			2,400	35,175	[3]	[3]
1923	174,814	833						
1924	156,919	773					[3]	
1925	171,742	694					[3]	
1926	127,308	411					[3]	
1927	120,238	345					[3]	
Totals	$2,929,279	$65,728	[3]3,900	$77,850	17,093	$191,287	[3]16,512	$639,304

[1]Includes Merced County.
[2]See Merced County.
[3]See under 'Unapportioned.'
[4]Includes Merced County production; also dredge yield of Shasta and Trinity Counties.
[5]Includes dredge production of Merced and Siskiyou Counties.

COUNTY, 1880-1927.

Mineral paint		Miscellaneous stone, value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
105	$2,310				
375	2,800		20 flasks	$800	Quicksilver
17	1,800				
152	1,825				
283	2,898				
204	1,769				
129	193				
200	375		79,330 lbs.	12,494	Copper.
200	350		162,400 lbs.	18,676	Copper.
1,370	2,400		116,000 lbs.	15,080	Copper.
200	1,600		7,300 lbs.	931	Copper.
				20	Platinum.
375	2,125				
250	1,720				
250	1,720				
285	2,000	74,000			
285	2,225	225		82,317	Unapportioned, 1900-1909.
40	270				
96	600				
100	600	63,572			
255	1,530	14,482			
52	286	3,096			
[3]		2,250		189,521	Gold, mineral paint, silver, platinum, quicksilver.
507	2,200	17,784		230,638	Chromite, brick, gold, platinum, quicksilver, silver.
[3]		6,240	1,438 tons	29,240	Chromite.
				183,167	Gold, mineral paint, platinum, silver.
498	3,088	38,764	1,352 tons	56,505	Chromite.
				308	Other minerals.
[3]		28,922		[1]165,989	Gold, mineral paint, platinum, silver.
669	7,062	181,262		1,043	Platinum and quicksilver.
[3]		180,697		3,777	Manganese, mineral paint, platinum, quicksilver.
[3]	[3]	299,962		116,730	Gold, manganese ore, mineral paint, platinum, silver.
1,023	10,745	231,965		27,158	Magnesite, manganese ore, platinum.
[3]		118,050		30,296	Magnesite, manganese ore, mineral paint, platinum.
[3]		221,256		21,774	Magnesite, manganese ore, mineral paint, platinum.
[3]		259,806		12,957	Magnesite, mineral paint, platinum.
				12,700	Magnesite, mineral paint, platinum.
[2]7,920	[3]54,491	$2,003,564		$1,212,121	

SUTTER COUNTY, 1908-1927.

Year	Amount	Value	Substance
1908	5,000 tons	$5,000	Macadam.
1909			
1916	5,733 tons	6,450	Crushed rock.
1917	4,500 tons	5,000	Crushed rock.
1918			
1919			
1920		54	Other minerals.
1921		54	Other minerals.
1922		97	Unapportioned.
1923		97	Unapportioned.
1924		97	Unapportioned.
1925		397	Unapportioned.
1926		397	Unapportioned.
1927		300	Unapportioned.
Total		$17,943	

TEHAMA

Year	Gold, value	Chromite		Brick	
		Tons	Value	M	Value
1880-1884	$22,000				
1894		1,680	$12,680		
1895		950	9,025	500	$2,500
1896		56	475		
1897					
1898				200	1,400
1899				300	1,800
1900				325	2,200
1901				300	2,000
1902				500	3,500
1903				600	4,500
1904				500	3,500
1905				650	5,000
1906				700	5,600
1907				400	3,200
1908				400	3,000
1909					
1910				600	3,600
1911					
1912				225	1,300
1913				300	1,800
1914					
1915		[2]		400	2,700
1916		1,896	39,702	[2]	
1917		2,053	41,646		
1918		3,261	152,291		
1919		[2]			
1920					
1921					
1922				[2]	
1923					
1924		[2]		[2]	
1925				[2]	
1926		[2]		[2]	
1927					
Totals	$22,000	[2]9,896	$255,819	[2]6,800	$47,600

[1]Includes crushed rock, rubble, sand, gravel.
[2]See under 'Unapportioned.'

COUNTY, 1880-1927.

Mineral water		Salt, value	Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Gallons	Value			Amount	Value	Substance
10,000	$2,400					
54,000	8,000					
10,000	18,000					
20,000	4,000					
5,000	2,500					
8,000	4,000					
8,000	4,000					
550,000	55,000					
20,000	2,000	300				
5,000	500	300				
5,000	500	300				
5,000	500					
75	42		$600			
100	100	200				
1,000	500	[2]	750		$752	Chromite and salt.
[2]			11,076		3,575	Brick, granite, mineral water, natural gas.
			2,373			
			2,500		2,800	Other minerals.
			7,500		1,500	Other minerals.
			[2]		26,400	Unapportioned.
			30,520		300	Other minerals.
			[2]		9,388	Brick, miscellaneous stone.
			4,900		1,316	Other minerals.
			26,054		8,400	Brick, chromite.
			[2]		77,183	Brick, miscellaneous stone.
			2,100		8,240	Brick, chromite.
			4,450		900	Other minerals.
[2]701,175	$102,012	[2]$1,100	$92,823		$140,751	

Year	Gold, value	Silver, value	Quicksilver	
			Flasks	Value
Altoona Mine, before 1875 (est.)*	[6]	[6]	1,000	$88,000
1875			1,500	126,425
1876			1,979	87,076
1877			1,317	49,129
1878			1,534	50,469
1879			1,919	57,282
1880	$326,693	$142	245	7,595
1881	550,000	1,500		
1882	600,000			
1883	400,000			
1884	529,150	[2]334		
1885	338,148	10		
1886	464,726	219		
1887	553,051	924		
1888	589,000	500		
1889	$11,632	640		
1890	1,192,790	259	240	12,600
1891	1,327,787	2,249		
1892	1,446,603	168		
1893	1,122,995			
1894	1,012,666	325		
1895	1,166,745	1,257	3,926	137,410
1896	1,296,330		4,205	139,035
1897	1,078,372	259	838	29,330
1898	$59,255	314	4,032	151,200
1899	590,510	1,086	3,076	123,624
1900	571,605	[3]7,935	2,294	105,982
1901	684,683	[3]1,240	1,302	58,668
1902	719,992	550	240	10,251
1903	607,728	2,085	266	11,156
1904	574,814	135	102	3,864
1905	690,844	3,044	389	13,917
1906	560,843	2,981	166	6,059
1907	535,316	2,399	98	3,739
1908	602,944	4,269	90	3,808
1909	520,046	2,302	197	7,915
1910	500,851	1,960	133	5,622
1911	612,149	6,777	44	2,024
1912	723,503	7,494	18	758
1913	431,862	2,119	4	161
1914	743,512	3,374		
1915	441,846	3,470	[4]	
1916	435,493	7,591	[4]	
1917	602,048	10,021	[4]	
1918	444,729	6,912	[4]	
1919	538,494	3,872	[4]	
1920	541,387	3,469	[4]	
1921	437,993	1,390		
1922	182,918	2,432		
1923	617,841	5,816		
1924	422,281	10,934		
1925	424,037	7,724		
1926	483,471	13,276		
1927	409,492	12,326		
Totals	$31,319,175	$148,083	[4]31,151	$1,293,099

*Bradley, W. W., Quicksilver resources of California; Cal. State Min. Bur., Bull. 78, p. 200, 1918.
[1]Includes crushed rock, rubble, sand, gravel.
[2]Lawver, A. M., in 'Production of Precious Metals in U. S.'; Report of Director of Mint, 1884, p. 175, 1885.
[3]Recalculated to 'commercial' from 'coining value' as originally published.
[4]See under 'Unapportioned.'
[5]The metal contained in the 1919 product was 38% iridium and 62% platinum.
[6]No county segregated figures for gold and silver available for years earlier than 1880.

COUNTY, 1875-1927.

Platinum		Miscellaneous stone[1] value	Miscellaneous and unapportioned		
Ounces	Value		Amount	Value	Substance
			3,620 cu. ft.	$5,000	Granite.
			500 cu. ft.	375	Granite.
			5,750 cu. ft.	4,535	Granite.
			4,838 lbs.	761	Copper.
			6,870 cu. ft.	5,500	Granite.
39	$468				
13	200		100 cu. ft.	75	Granite
11	275				
26	450				
7	130				
"					
"					
"				111,307	Unapportioned, 1900-1909
"					
"					
"		$2,000			
"		1,000			
5	151			245	Mineral water.
13	435	900	120 gals.	360	Mineral water.
				52,500	Other minerals.
113	5,161	1,000		397,316	Chromite, copper, manganese, mineral water, quicksilver.
50	3,283	7,718	242 tons	6,325	Chromite.
				358,447	Copper, manganese, mineral water, quicksilver.
41	3,136	1,513	1,814 tons	75,660	Chromite.
				175,574	Copper, mineral water, quicksilver.
[4] [5]		11,839		17,444	Copper, mineral water, platinum, quicksilver.
fine ounces					
37	6,612	8,799		1,838	Other minerals.
27	3,260	"		14,239	Quicksilver, miscellaneous stone.
12	1,223	5,677		5,687	
18	2,050	3,000	329,706 lbs.	48,467	Copper.
11	1,839	2,240	550,000 lbs.	72,050	Copper.
26	3,081	5,000	439,766 lbs.	62,447	Copper.
28	2,832		760,140 lbs.	106,420	Copper.
				4,000	Other minerals.
		32,250	770,882 lbs.	100,986	Copper.
				800	Other minerals.
477	$34,586	$82,936		$1,633,358	

TULARE

Year	Gold, value	Silver, value	Brick		Gems, value	Granite	
			M	Value		Cubic feet	Value
1880	$1,125	$526					
1881	8,181	36					
1882	5,000	2,000					
1883	4,000	1,000					
1884	70,000						
1885	7,500						
1886	6,900	50					
1887	15,640	167					
1888	25,000						
1889	39,340	250					
1890	43,019						
1891	15,095						
1892	24,355	11					
1893	12,818						
1894						4,668	$10,000
1895	16,320					3,000	2,500
1896	20,092					2,800	4,700
1897	12,830	214				3,600	8,000
1898	12,400		300	$2,000		700	1,500
1899	13,610		600	4,200		1,200	3000
1900	10,445	433	650	6,100		1,500	3,000
1901	14,616	100	1,600	8,600		9,000	18,000
1902	11,648		4,500	27,000	$500	1,790	4,000
1903	9,215		1,500	9,500	500	3,000	2,260
1904	1,100		1,250	10,000		7,000	16,000
1905	2,300	13	2,000	16,000	5,000	7,000	9,000
1906	20		1,500	12,000	209,790	7,000	9,000
1907			2,500	20,000	26,206		
1908			2,250	18,000	62,250		
1909			6,620	42,400	58,000		
1910			8,195	64,000	104,000	700	1,500
1911			10,225	81,000	20,000		
1912			10,900	70,500	5,350		
1913			6,000	45,000	1,500		
1914			6,838	47,507			
1915			5,520	33,364			
1916			6,330	48,500			[2]
1917			6,771	112,938			[2]
1918			[2]		[2]		[2]
1919			and tile	34,978			[2]
1920			[2]				
1921							[2]
1922			[2]			[2]	
1923			[2]			[2]	
1924			[2]			[2]	
1925			[2]				62,260
1926			[2]			[2]	
1927			[2]			[2]	
Totals	$402,569	$4,800		[2]$713,587	[2]$193,096		$151,720

[1]Includes crushed rock, rubble, sand, gravel.
[2]See under 'Unapportioned.'

COUNTY, 1880-1927.

Magnesite		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value		Amount	Value	Substance
			80 tons	$960	Limestone.
			1,000 bbls.	1,500	Lime.
200	$1,500		22 tons	88	Gypsum.
3,511	28,210				
2,450	19,250				
1,300	19,600	$100			
2,800	9,100			50,108	Unapportioned, 1900-1909
2,380	21,420		400 tons	2,200	Gypsum.
6,567	52,642				
6,468	47,200		2,803 lbs.	360	Copper
				185	Natural gas.
7,110	35,550		2,000 M cu.ft	1,000	Natural gas
7,763	57,335				
6,684	66,840		100 cu. ft.	200	Marble.
			80 tons	200	Quartz.
7,858	62,864	4,350	392 cu. ft.	796	Marble.
			1,429 tons	5,050	Feldspar
			1,250 tons	2,400	Quartz.
9,650	96,500	1,750	2,830 tons	13,065	Feldspar.
			6 cu. ft.	30	Marble.
			1,349 tons	1,888	Limestone.
11,574	104,166	36,851	1,800 tons	6,500	Feldspar.
				1,830	Chromite and silica.
			3,435 tons	42,555	Chromite.
87,606	737,130	82,255	1,422 lbs.	350	Copper.
				36,410	Feldspar, granite, limestone, marble, silica.
			450 tons	11,000	Chromite.
136,562	1,238,853	75,594	240 tons	1,580	Feldspar.
				60,023	Building, tile, copper, graphite, limestone, talc
			600 tons	24,000	Chromite.
			444 tons	2,928	Feldspar.
28,826	269,748	125,407	8,400 tons	32,400	Limestone.
			204 tons	1,143	Silica.
				71,782	Brick, gems, granite, soapstone, talc, tile.
			10,347 tons	46,388	Limestone.
18,765	186,601	10,811	700 M cu. ft.	295	Natural gas.
				51,928	Chromite, feldspar, granite.
			400 M cu. ft.	195	Natural gas.
35,305	394,169	8,465		190,467	Brick, feldspar, granite, limestone
			10,030 tons	40,090	Limestone.
11,454	125,594	284,122	380 M cu. ft.	190	Natural gas.
				102,238	Brick and granite.
			380 M	190	Natural gas.
17,223	181,842	151,000		189,662	Brick, tile, granite, limestone.
			380 M	190	Natural gas.
24,058	298,272	1,990	15,500 tons	57,500	Limestone.
				108,607	Brick, granite.
			1,080 M	540	Natural gas.
21,203	271,830	80,411		145,893	Brick, hollow tile, granite, limestone.
			280 M	175	Natural gas.
18,150	245,557	47,176	13,300	43,900	Limestone.
				27,911	Brick, lime.
			593 tons	7,709	Lime.
13,378	138,347	73,881	18,000 tons	70,000	Limestone.
				107,983	Brick, hollow tile, granite, natural gas.
[2]		15,082		459,091	Brick, hollow tile, granite, lime, limestone, magnesite.
488,845	$4,710,120	$848,245		$2,023,673	

TUOLUMNE

Year	Gold, value	Silver, value	Lime		Limestone	
			Barrels	Value	Tons	Value
1880	$461,861	$1,071				
1881	500,000	1,000				
1882	400,000					
1883	320,000					
1884	310,000					
1885	320,903	1,473				
1886	432,438	1,551				
1887	504,662	3,166				
1888	475,000	3,500				
1889	446,300	543				
1890	1,500,629	13,062				
1891	1,384,950	139				
1892	1,092,549	911				
1893	354,734	1,329				
1894	547,448	1,072				
1895	666,754	313				
1896	1,070,141	328				
1897	1,809,572	1,696				
1898	1,734,953	15,582				
1899	1,635,769	15,111				
1900	1,596,891	62,367				
1901	1,670,368	39,787				
1902	1,791,829	6,580				
1903	1,732,572	13,989	1,600	$1,600		
1904	1,563,907	12,963				
1905	1,291,726	21,348	500	1,000		
1906	1,039,675	8,476	500	1,000		
1907	806,875	6,453	110,000	125,000		
1908	798,752	11,732	60,000	69,500	1,233	$6,500
1909	925,703	4,384	60,000	60,000	15,057	28,942
1910	615,626	5,754	78,300	78,300	3,600	10,400
1911	1,093,484	13,243	75,000	70,000	4,319	13,609
1912	1,113,291	25,146	117,450	121,250	11,554	20,099
1913	974,409	24,381	75,000	85,000	12,446	20,676
1914	940,793	12,017	63,331	38,000	16,707	21,907
1915	1,058,103	13,480	[7]		8,859	11,349
1916	868,237	17,039	[7]		3,137	5,132
1917	321,085	7,808	[7]		3,287	6,481
1918	274,328	21,425	[7]		3,064	5,600
1919	471,021	11,076	[7]		[2]	
1920	254,569	6,007	[7]		7,494	15,288
1921	96,026	2,505	[7]		3,650	9,475
1922	222,366	2,976				
1923	261,936	2,801			3,140	7,680
1924	255,994	1,106			8,515	19,983
1925	155,592	614				[4]268,000
1926	119,873	1,119				
1927	40,209	302			[7]	
Totals	$38,323,903	$418,725	641,681	$650,659	106,062	$481,121

[1] Includes mineral paint and sandstone.
[2] Includes granite, lime, magnesite, marble.
[3] Includes clay, dolomite, granite, lime, marble.
[4] Includes lime.
[5] Includes dolomite, granite, marble.
[6] Includes granite, lead, lime, limestone, magnesite, marble, silica.
[7] See under 'Unapportioned.'

COUNTY, 1880-1927.

Marble		Copper		Miscellaneous stone[1], value	Miscellaneous and unapportioned[7]		
Cubic feet	Value	Pounds	Value		Amount	Value	Substance
					800 M.	$2,288	Brick.
						1,301	Unapportioned, 1900-1909.
					400 lbs.	16	Lead.
7,000	$14,000	155,826	$17,920				
11,550	28,875				10,367 cu. ft.	14,020	Granite.
11,500	28,750				9,700 cu. ft.	9,700	Granite.
11,000	66,000				9,700 cu. ft.	9,700	Granite.
23,000	46 000				9,700 cu. ft.	9,700	Granite.
					197 tons	1,379	Chromite
22,030	60,120						
18,503	47,165	140,000					
27,600	107,400	9,086	1,154		30 tons	180	Chromite.
17,360	45,400				2,502 lbs.	111	Lead
18,966	50,398						
27,720	73,920						
37,312	93,726	893	138		893 lbs.	53	Lead.
21,830	38,202	45	6		89 lbs.	3	Lead.
					352 tons	2,352	Chromite.
[7]		27,667	4,842	$1,900	1,779 lbs.	84	Lead.
						79,328	Dolomite, lime, marble.
					285 tons	4,556	Chromite.
[7]		1,797	442	1,500	873 lbs.	60	Lead.
						107,296	Dolomite, lime, magnesite, marble.
					2,680 tons	54,290	Chromite.
[7]		32,840	8,960	3,800	997 lbs.	86	Lead.
						108,758	Dolomite, lime, magnesite, marble.
[7]		35,127	8,676	1,700	4,269 tons	168 693	Chromite.
						121,806	Lime, manganese, marble.
[7]		[7]		2,700		110,746	Lime and limestone.
						78,950	Chromite, copper, granite, marble.
[7]				28,696		209,354	Dolomite, lime, marble, platinum.
[7]				229,185		217,292	Dolomite, granite, lime, marble.
				246,460		293,136	Other minerals[1]
				9,800		388,145	Other minerals[2]
				12,500		339,573	Other minerals[3]
				29,751		113,305	Other minerals[5]
		2,332	326	56,097		438,583	Other minerals.[6]
[7]				31,416		360,489	Limestone, marble, slate.
255,371	$699,756	265,613	$42,469	$655,550		$3,245,283	

Year	Gold, value	Petroleum		Natural gas		Asphalt and bituminous brick		Brick	
		Barrels	Value	M cu. ft.	Value	Tons	Value	M	Value
1880	$354	[2]							
1881	600								
1882									
1883									
1884									
1885									
1886									
1887									
1888									
1889									
1890	2,468								
1891	1,715								
1892									
1893									
1894		290,913	$367,822			248	$4,800		
1895		244,624	244,624			175	3,500		
1896		248,000	272 800						
1897		368 282	368,282						
1898		427,000	571,000			4,105	80,775	286	$2,228
1899	3,990	496,200	496,200			5,188	103,760	375	3,000
1900	2,562	443,000	398,700			1,466	31,670	230	1,700
1901	4,183	472,057	236,028			2,073	30,945		
1902	2,012	475,000	455,000			37	370		
1903	1,087	542,902	517,611			1,114	13,368	1,380	12,900
1904	2,700	518,000	465,682	1,800	$2,700	3,169	38,028		
1905	1,200	375,522	236 578	3,831	5,000	3,000	30,000	1,300	10,400
1906	[3]	311,000	155,500	3,500	1,000	3,700	37,000	1,675	11,650
1907		352,224	211,334	1,825	2,278			1,600	12,800
1908		289,625	217,219	3,625	4,531			200	1,500
1909		344,419	223 872	1,721	2.151			1,275	7,625
1910		492,147	319,898	545	681			1,190	36,945
1911		499,082	349,777	[4]29,580	2,958			900	5,100
1912		662,300	584,811	[4]55,068	4,163			550	3,575
1913		899,007	907,997	62,200	6,220			1,023	6,085
1914		943,929	991,125	100,000	6,000			449	3,102
1915		1,017,220	869,723	491,879	29,670			200	2,500
1916		943,499	985,956	806,540	133,867			[3]	
1917		996,501	1,313,388	1,033,564	152,550			[3]	
1918		1,339,342	1,982,226	858,457	150,885				
1919		1,685,073	2,755,094	1,038,574	252,240			[3]	
1920		1,989,681	4,988,130	1,521,448	214,280				
1921		2,167,326	5,869,119	2,127,476	360,443			[3]	
1922		2,933,685	5,236,628	3,583,818	536,502				
1923		3,610,794	4,109,084	4,162,318	470,261				
1924		3,958,010	5,279,985	5,995,760	633,352				
1925		9,221,846	15,769,357	20,144,646	1,953,163				
1926		16,99[illegible],275	25,695,344	41,559,144	4,080,040				
1927		19,996,841	23,536,282	71,036,201	6,951,273				31,832
Totals	$22,871	76,549,326	$106,942,876	154,623,520	$15,956,208	24,275	$374,216		$152,942

[1]Includes crushed rock, rubble, sand, gravel.

[2]Commercial production of petroleum in Ventura County began at least as early as 1874, in the Sulphur Mountain district, but detailed county segregations are not available for the early years.

[3]See under 'Unapportioned.'

[4]Quantity estimated, as only values given in reports of those years.

COUNTY, 1880-1927.

Pottery clay		Sandstone		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
Tons	Value	Cubic feet	Value		Amount	Value	Substance
		16,200	$16,500				
		33,200	20,000				
					250 tons	$6,500	Borax.
		12,500	6,250	$35,279			
		4,200	2,650	16,764	3,000 tons	60,000	Borax.
		3,200				4	Silver.
		1,750	1,600	22,500	50 tons	2,500	Mica.
		6,000	900	25,100	3,500 tons	140,000	Borax.
					50 tons	3,800	Mica.
		2,300	3,500	31,227	50 tons	3,000	Mica.
30	$45		1,380	60,490			
		1,320	792				
				20,880			
560	1,680			15,406			
				144,226		830,853	Unappropriated 1900-1909
		900	450	35,000			
1,900	1,900	4,658	2,325	750			
1,000	1,000	4,600	1,850				
3,000	2,990	300	150			1,530	Unapportioned.
		1,195	502				
				2,674		200	Other minerals.
[3]		[3]		14,200		1,407	Brick, clay, sandstone.
[3]		[3]		30,000		2,072	Brick and sandstone.
		[3]		52,900		300	Other minerals.
[3]		[3]		5,000		4,500	Clay and clay products.
						190	Other minerals.
[3]		[3]		26,265		500	Mineral paint and sandstone
				11,250		3,985	Clay and clay products.
						472	Mineral paint and sandstone.
				62,888		1,060	Mineral paint and sandstone.
				88,211		12,128	Mineral paint and sandstone.
		[3]		173,337		2,720	Limestone.
				131,200			
373,060	93,250			339,435		300	Other minerals.
354,418	63,120			412,872			
733,908	$248,693	[3]92,323	$58,849	$1,757,674		$1,078,021	

YOLO COUNTY, 1873-1927.

Year	Quicksilver		Sandstone		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
	Flasks	Value	Cubic feet	Value		Amount	Value	Substance
1873	[2]995	$79,928						
1874	3,000	315,540						
1875								
1876	965	42,460						
1877	1,516	56,547						
1878	1,640	53,956						
1879	1,110	33,134						
1880	422	13,082						
1881								
1894			2,500	$1,000				
1895			542	1,873				
1896			252	378				
1897								
1898			264	384				
1899			264	384				
1900			908	1,760				
1901			1,540	2,300				
1902			328	450				
1903			280	144				
1904			180	720				
1905			175	200				
1906			160	204				
1907			250	350				
1908			140	1,150				
1909								
1910								
1911								
1912								
1913								
1914	15	736						
1915	[3]				$1,200		$840	Other minerals.
1916					300			
1917	[3]				4,300		1,261	Other minerals.
1918	[3]				17,915		3,300	Other minerals.
1919	[3]				5,600		19,866	Other minerals.
1920					9,472			
1921					14,829			
1922					[3]		13,431	Unapportioned.
1923					[3]		16,057	Unapportioned.
1924					[3]		15,800	Unapportioned.
1925					23,060			
1926					20,560			
1927					17,805			
Totals	[2]2,663	$595,383	7,783	$11,297	$115,131		$71,455	

[1]Includes crushed rock, sand, gravel.
[2]Flasks of 76½ pounds, previous to June, 1904; of 75 pounds since
[3]See under 'Unapportioned.'

YUBA COUNTY, 1880-1927.

Year	Gold, value	Silver, value	Platinum		Miscellaneous stone[1], value	Miscellaneous and unapportioned		
			Ounces	Value		Amount	Value	Substance
1880	$943,860	$438						
1881	800,000	1,300						
1882	750,000							
1883	455,000							
1884	250,000							
1885	207,449							
1886	149,203							
1887	162,426							
1888	150,000							
1889	112,053	115						
1890	141,781							
1891	37,576							
1892	44,218							
1893	30,839							
1894	107,480							
1895	111,482							
1896	171,688							
1897	141,638							
1898	166,865							
1899	189,927	12						
1900	280,366	[2]2,041						
1901	188,908	[2]393						
1902	155,630	2						
1903	125,830	41						
1904	139,528					400 M. 375 tons	$3,000 750	Brick. Pottery clay.
1905	324,135	369				400 tons 2,000 gals.	80 800	Pottery clay. Mineral water.
1906	[3]	[3]				2,000 gals.	800	Mineral water.
1907	1,766,770	6 167				1,800 gals.	720	Mineral water.
1908	2,034,486	9,997			$5,750	1,000 M.	10,000	Brick.
1909	2,469,865	4,156			5,650	550 M. ----------	6,600 568,564	Brick. Unapportioned. 1900-1909.
1910	3 204,273	5,372						
1911	2,997,072	5,299			9,318			
1912	2,753,408	6,198			15,526			
1913	2,491,505	7,571			8,063			
1914	2,800,713	5,295	74	2,377	14,895			
1915	2,703,710	5,254	132	4,174	149,292			
1916	3,167,723	5,934	314	14,301	42,685	4,817 lbs. ----------	1,185 6,000	Copper. Other minerals.
1917	3,667,673	6,591	149	8,869	28,863			
1918	3,767,933	13,796	189	12,930	43,338		6,888	Other minerals.
1919	4,195,732	12,276	[4]125	13,098	40,439			
1920	3,467,769	16,502	113	14,395	74,943		40	Other minerals.
1921	4,738,248	26,135	179	14,396	73,387		100	Other minerals.
1922	2,492,948	8,222	115	11,077	75,969		100	Other minerals.
1923	3,150,405	6 760	158	16,974	216,890		100	Other minerals.
1924	1,965,434	4,461	73	8,773	181,113		100	Other minerals.
1925	2,570,630	6,400	[3]		137,288		7,276	Natural gas, platinum.
1926	2,769,703	6,398	[3]		133,298		11,695	Natural gas, platinum.
1927	3,468,201	6,743			198,688		6,000	Other minerals.
Totals	$69,012,083	$180,238	1,621	$121,364	$1,455,395		$630,798	

[1]Includes crushed rock, sand, gravel.
[2]Recalculated to 'commercial' from 'coining value' as originally published.
[3]See under 'Unapportioned.'
[4]Includes some palladium.

APPENDIX A.

DIRECTORY OF PRODUCERS OF METALLIC AND NON-METALLIC MINERALS IN CALIFORNIA, 1927

NOTE.—The producers of natural gas and petroleum will be found in Summary of Operations, California Oil Fields, for August, 1927 (Vol. 13, No. 2). This list also excludes producers of copper, gold, lead, platinum, silver and zinc. Gold and silver figures are received by the State Division of Mines and Mining direct from the U. S. Bureau of Mines, and copper, lead, platinum and zinc statistics are gathered in part from reports received from smelters.

APPENDIX A.

DIRECTORY OF PRODUCERS OF METALLIC AND NON-METALLIC MINERALS IN CALIFORNIA, 1927

ANTIMONY

	Address	Mine or Plant
San Benito County		
Stayton Quicksilver Mines, R. E. Knox	Hollister	Hollister

BARITE

	Address	Mine
Mariposa County		
Yosemite Barium Co., R. A. Fredericks, Pres. and Mgr.	El Portal	El Portal
Nevada County		
Democrat Barite Mine, Chemical and Pigment Co.	766 50th Ave., Oakland	Bear River
Orange County		
Red Hill Quicksilver Mine, F. B. Browning	Tustin	Tustin

BITUMINOUS ROCK

	Address	Quarry
Santa Barbara County		
Higgins Quarry, A. Satler, lessee	Carpinteria	Carpinteria
Santa Cruz County		
Bitumen Mines Operation, John De Bruynkops	701 Post St., San Francisco	Santa Cruz

BORATES

	Address	Plant
Inyo County		
Rasor Borate Lease, C. M. Rasor	Care of Pac. Coast Borax Co., 1014 Cent. Bldg., Los Angeles	Death Valley
Pacific Coast Borax Co.	1014 Central Bldg., Los Angeles	----------
Kern County		
Pacific Coast Borax Co.	1014 Central Bldg., Los Angeles	Kramer
San Bernardino County		
Amer. Potash and Chemical Corp	Trona	Trona

BROMINE

	Address	Plant
San Diego County		
California Chemical Corp.	233 Sansome St., San Francisco	----------

CALCIUM CHLORIDE

	Address	Plant
San Bernardino County		
California Rock Salt Co.	2465 Hunter St., Los Angeles	Amboy
Saline Products, Inc.	2000 Santa Fe Ave., Los Angeles	

CEMENT

	Address	Plant
Calaveras County		
Calaveras Cement Co.	315 Montgomery St., San Francisco	San Andreas
Contra Costa County		
Henry Cowell Lime and Cement Co.	2 Market St., San Francisco	Cowell
Kern County		
Monolith Portland Cement Co.	Bartlett Bldg., Los Angeles	Monolith
Merced County		
Yosemite Portland Cement Co.	Merced	Merced
Riverside County		
Riverside Portland Cement Co.	800 Corporation Bldg., Los Angeles	Riverside
San Benito County		
Pacific Portland Cement Co.	Hunter Dulin Bldg., San Francisco	San Juan
San Bernardino County		
Golden State Portland Cement Co.	800 Corporation Bldg., Los Angeles	Oro Grande
Southwestern Portland Cement Co.	Victorville	Victorville
California Portland Cement Co.	1228 Pac. Mutual Bldg., Los Angeles	Colton
San Mateo County		
Pacific Portland Cement Co.	111 Sutter St., San Francisco	Redwood City
Santa Cruz County		
Santa Cruz Portland Cement Co.	Crocker Bldg., San Francisco	Davenport
Solano County		
Pacific Portland Cement Co.	111 Sutter St., San Francisco	Cement

CLAY

(Including producers of crude clay and manufacturers of brick, tile, porcelain, etc.)

	Address	Plant
Alameda County		
California Faience Co.	1335 Hearst Ave., Berkeley	Berkeley
California Pottery Co.	2265 E. 12th St., Oakland	
N. Clark & Sons	116 Natoma St., San Francisco	Oakland
California Brick Plant, W. S. Dickey Clay Mfg. Co.	604 Mission St., San Francisco	Pabrico and Livermore
Electrical Porcelain Works	2416 6th St., Berkeley	Berkeley
Kraftile Co.	55 New Montgomery, San Francisco	Niles
Livermore Clay and Sand Co.	P. O. Box 521, Livermore	Tesla
M. and S. Tile Co.	Decoto	Decoto
Miller's Oakland Art Pottery	2237 E. 12th St., Oakland	
Muresque Tiles, Inc.	1001 22d Ave., Oakland	
Remillard Brick Co.	332 Phelan Bldg., San Francisco	Pleasanton
Technical Porcelain and China Ware Co.	420 Kains Ave., Albany, via Berkeley	Albany
Walrich Pottery	1285 Hearst Ave., Berkeley	Berkeley
Westinghouse High Voltage Insulator Co.	62d and Green Sts., Oakland	
Amador County		
M. J. Bacon	Ione	Carbondale
Carlisle Clay Co.	Ione	Ione
N. Clark and Sons	116 Natoma St., San Francisco	Ione
Ione Clay and Sand Co., California Mineral Products Co.	Kohl Bldg., San Francisco	Ione
Ione Clay Pit, W. S. Dickey Clay Mfg. Co.	604 Mission St., San Francisco	Ione
Ione Fire Brick Co.	541 Rialto Bldg., San Francisco	Ione
Newman Clay Co., Newman Estate	Ione	Ione
Preston School of Industry	Ione	Ione
Yosemite Portland Cement Co.	Merced	Ione
Butte County		
Coast Rock and Gravel Co., Oroville Clay Deposit	1000 Hunter-Dulin Bldg., San Francisco	Oroville
Table Mountain Clay Prod. Co.	Oroville	Oroville
Calaveras County		
California Pottery Co.	2265 E. 12th St., Oakland	Valley Springs
Contra Costa County		
California Art Tile Co.	Box 1116, Richmond	Richmond
N. Clark & Sons, Clark Shale Deposit	116 Natoma St., San Francisco	Walnut Creek
Elsenius Pottery, C. A. Elsenius, Mgr.	1633 Woolsey St., Berkeley	Richmond
Mastercraft Tile and Roofing Co.	1 20th St., Richmond	San Pablo
Port Costa Brick Works	808 Sharon Bldg., San Francisco	Port Costa
Richmond Pressed Brick Co.	Sharon Bldg., San Francisco	Richmond
Standard Sanitary Mfg. Co., Pacific Mines	Box W., Richmond	Contra Costa
Fresno County		
Craycroft-Brick Co.	Griffith-McKnight Bldg., Fresno	
Pioneer Brick and Tile Co.	P. O. Box 614, Fresno	
Humboldt County		
J. D. Thompson Brick Co., J. D. Thompson, Mgr.	Box 16, Myrtle Ave., Eureka	Eureka
Imperial County		
Simons Brick Co., Walter R. Simons	125 W. 3d St., Los Angeles	El Centro

CLAY (Continued)

(Including producers of crude clay and manufacturers of brick, tile, porcelain, etc.)

	Address	Plant
Kern County		
Alluvial Silt Co., V. E. Britton	Muroc	
Bakersfield Sandstone Brick Co., Jas. Curran, Mgr.	Bakersfield	
King Lumber Co.	1402 King St., Bakersfield	Bakersfield
Los Angeles County		
Acme Brick Co.	Hillstreet Bldg., Los Angeles	Santa Monica
Alhambra Kilns, Inc.	Alhambra	Alhambra and Santa Monica
American Refractories Co.	3232 Alosta St., Los Angeles	
Angulo Tile Plant, R. F. Angulo & Sons	Reseda, Los Angeles	Reseda
Atlas Firebrick Co.	Box 938, R.F.D. 2, Los Angeles	
Aztec Tile, Inc.	Stanford St., Santa Monica	Santa Monica
Bay Cities Roofing Co., Inc.	1724 Stanford St., Santa Monica	Santa Monica
Batchelder-Wilson Tile Co.	2633 Artesian St., Los Angeles	
J. A. Bauer Pottery Co., Inc.	415 W. Avenue 33, Los Angeles	
California Clay Products Co.	South Gate	
Claycraft Potteries	3101 San Fernando Blvd., Los Angeles	
H. F. Coors Co., Inc.	Inglewood	Inglewood
Davidson Brick Co.	Monterey Pass Road, 5301 Chicago St., Los Angeles	
Empire China Co.	Burbank	
The Feather-Stone Co.	911 Mateo St., Los Angeles	Covina
Italian Terra Cotta Co.	1149 Mission Road, Los Angeles	
K & K Brick Co., C. J. Kuback, Pres.	701 Merch. National Bank Bldg., Los Angeles	
K & M Pottery Co.	2318 E. 52d St., Los Angeles	
Los Angeles Brick Co.	1078 Mission Road, Los Angeles	
Long Beach Brick Co., Inc., H. A. Havner, Mgr.	243 E. 7th St., Long Beach	
Malibu Potteries Co.	119 N. Larchmont St., Los Angeles	
Mission Brick Co.	15209 Saugus St., Van Nuys	Van Nuys
National Brick Co.	5547 Alhambra Road, Los Angeles	Alhambra
Pacific Clay Products	650 Chamber of Commerce Bldg., Los Angeles	L. A. and Los Nietos
Pomona Brick Co.	Pomona	Pomona
Poxon China Co.	5600 Miles Ave., Huntington Park	
Pomona Tile Co.	Pomona	Pomona
Santa Catalina Island Co., Wm. Wrigley, Jr.	Avalon	Santa Catalina Island
Santa Monica Brick Co.	453 S. Spring St., Los Angeles	Santa Monica
Simons Brick Co., Walter R. Simons	125 W. 3d St., Los Angeles	
Standard Brick Co.	580 Chamber of Commerce Bldg., Los Angeles	
St. Louis Fire Brick and Clay, Joseph Mesmer	2464 E. 9th St., Los Angeles	
Tropico, Los Angeles and Santa Monica Plants, Gladding, McBean and Co.	660 Market St., San Francisco	Tropico, Los Angeles and Santa Monica
C. M. Van Orden Co.	128 S. Avenue 64, Los Angeles	
Vernon Potteries	2300 E. 52d St., Los Angeles	Vernon
Vitrefrax Co.	5100 Pacific Ave., Los Angels	
Western Brick Co.	586 Chamber of Commerce Bldg., Los Angeles	
Whiting-Mead Pottery Co.	415 E. 9th St., Los Angeles	

CLAY (Continued)

(Including producers of crude clay and manufacturers of brick, tile, porcelain, etc.)

	Address	Plant
Marin County		
Greenebrae Tile Plant	1129 Vallejo St., San Francisco	Greenbrae
McNear Brick Co.	946 Monadnock Bldg., San Francisco	McNears
Merced County		
The California Pottery Co.	Merced	Merced
Mendocino County		
W. N. Briggs	Ukiah	
Mono County		
California Quarries Corp.	1300 Quilby Bldg., Los Angeles	Laws
Monterey County		
Joe Arca	Castroville	Castroville
Monterey Mission Tile Co.	Monterey	
Orange County		
American Fire Clay Co.	San Juan Capistrano	San Juan Capistrano
El Toro Clay Co., Amer. Refractories Co.	3232 Alosta St., Los Angeles	El Toro
Emsco Clay Co.	8661 Dorothy Ave., South Gate	
Gladding, McBean & Co.	660 Market St., San Francisco	
La Bolsa Tile Co.	Huntington Beach	Smeltzer
Orange County Brick and Tile Co.	120 W. Commonwealth, Fullerton	Anaheim
Pacific Clay Products	650 Chamber of Commerce Bldg., Los Angeles	
Padre Tile Co.	Ehlen & Grote Bldg., Orange	
Placer County		
Clay Corporation of California	Lincoln	Lincoln
Gladding, McBean & Co.	660 Market St., San Francisco	Lincoln
Lincoln Clay Products Co., M. J. Dillman, Mgr.	Lincoln	
Riverside County		
Alberhill Coal and Clay Co., Geo. C. Hill	Alberhill	Alberhill
Emsco Clay Co.	5701 S. Boyle Ave., Vernon	Corona
G. R. Freeman	Corona	
Gladding, McBean & Co.	660 Market St., San Francisco	
Hancock's Brick Yard, C. P. Hancock & Son	1330 Lemon St., Riverside	
Los Angeles Brick Co.	1078 Mission Road, Los Angeles	Alberhill
Pacific Clay Products	650 Chamber of Commerce Bldg., Los Angeles	
Tarwater & Southard	Murietta	Murietta
Temescal Water Co.	Temescal, via Corona	Temescal
Sacramento County		
Cannon & Co.	Box 281, Sacramento	Ben Ali
H. C. Muddox	30th and L Sts., Sacramento	
Natoma Clay Co.	401 Hobart Bldg., San Francisco	Natomas
Panama Pottery Co.	Box 1478, R.F.D. 4, 24th St. Road, Sacramento	
Sacramento Brick Co.	1400 Front St., Sacramento	
Valley Brick Co.	1917 Stockton Blvd., Sacramento	
San Bernardino County		
Kennedy Clay Pit, John Kennedy	Daggett	Daggett
San Diego County		
American Encaustic Tile Co.	52d and Alameda Sts., Los Angeles	El Cajon
Atlas Brick and Clay Co.	3533 Herbert St., San Diego	Rose Canyon
California Clay Products Co.	South Gate	Encinitas
National Brick Co.	24th St. and National Blvd., National City	National City

CLAY (Continued)

(Including producers of crude clay and manufacturers of brick, tile, porcelain, etc.)

	Address	Plant
Old Mission Tile Co.	North San Diego	N. San Diego
Pacific Clay Products Co.	650 Chamber of Commerce Bldg., Los Angeles	----------
Union Brick Co.	3565 Third St., San Diego	----------
Vitrified Products Corp.	2841 Jefferson St., N. San Diego	----------
San Francisco County		
Jalanivich & Olsen	2930 Baker St., San Francisco	San Francisco
San Joaquin County		
San Joaquin Brick Co.	Channel and Webber Point, Stockton	----------
Stockton Brick and Tile Co.	McKinley Ave., Stockton	Stockton
Stockton Fire Brick Co., John T. Roberts, Mgr.	Stockton	Stockton
San Luis Obispo County		
San Luis Brick Works	San Luis Obispo	----------
San Mateo County		
West Coast Porcelain Co.	P. O. Box 46, Millbrae	----------
Santa Barbara County		
Angulo Tile Works	Reseda	Santa Barbara
L. L. Brentner	Carpinteria	Carpinteria
Santa Clara County		
Garden City Pottery	560 N. 6th St., San Jose	----------
Handcraft Tile Co.	333 S. 18th St., San Jose	San Jose
Kartschoke Clay Products Co.	1098 S. 3d St., San Jose	----------
Platis Premier Porcelain Co., Inc.	Box 547, Santa Clara	----------
Remillard Brick Co.	332 Phelan Bldg., San Francisco	San Jose
S & S Tile Co.	S. 4th St., San Jose	----------
San Jose Brick Co.	Box 274, San Jose	----------
Coyote Creek Clay Beds, City Manager City of San Jose	San Jose	San Jose
Sonoma County		
Beltane Clay Deposit, Harry Weiss	Glen Ellen	Beltane
Tehama County		
O'Connor Bros.	Red Bluff	----------
Tulare County		
S. P. Brick & Tile Co.	1501 Pacific S. W. Bldg., Fresno	Exeter
Ventura County		
Dent Clay Pit, John Dent	Ventura	Ventura
Anderson & Hardison Pressed Brick Co., J. C. Hardison and G. A. Anderson	Santa Paula	Santa Paula
Peoples Lumber Co.	1102 Meta St., Ventura	----------
Selby Shale Pit, Benj. Selby	Ventura	Ventura
Ventura Excavating Co., H. Love	Ventura	----------
Yuba County		
Marysville Brick Co.	312-A D St., Marysville	----------

COAL

	Address	Mine
Amador County		
Buena Vista Coal Mining Co., J. J. Morris, Supt.	R. F. D. Ione	Buena Vista

DIATOMACEOUS EARTH

	Address	Plant
Los Angeles County		
The Feather-Stone Co.	611 Mateo St., Los Angeles	Covina
Monterey County		
Buttle Properties, Inc.	Bradley	Bradley
California Kieselguhr Co., Geo. C. Langley and W. I. Davis	San Miguel	Bradley
Monterey Products Co.	Monterey	Del Monte
Santa Barbara County		
The Celite Co.	1320 S. Hope St., Los Angeles	Lompoc
Shasta County		
Mt. Shasta Silica Co., M. H. Nemeyer	Weed	Bartle

DOLOMITE

	Address	Mine
Inyo County		
Inyo Marble Co.	546 San Fernando Bldg., Los Angeles	Keeler
Monterey County		
Pacific Coast Steel Co., Stirling Ranch	Rialto Bldg., San Francisco	Natividad

FELDSPAR

	Address	Mine
Kern County		
N. W. Sweetser	1024 Loew State Bldg., Los Angeles	Rosamond
Riverside County		
American Encaustic Tiling Co.	52 S. Alameda St., Los Angeles	----------
San Diego County		
Pacific Mines, Standard Sanitary Mfg. Co.	P. O. Box W, Richmond	Campo
Globe Tile and Porcelain Works, Inc., White Rose Mine	Hynes	Campo

FULLER'S EARTH

	Address	Mine
Inyo County		
Commercial Minerals Co.	58 Sutter St., San Francisco	
San Bernardino County		
Death Valley Clay Co.	1212 Pac. Mutual Bldg., Los Angeles	Bradford Station
Martin Minerals Co., Gus G. Martin	Slauson and Alameda Sts., Los Angeles	Daggett
San Diego County		
General Petroleum Corp., Mosto Otaylite Deposit	1003 Higgins Bldg., Los Angeles	Otay
Standard Oil of California	Standard Oil Bldg., San Francisco	Otay

GEMS

	Address	Mine
Butte County		
William Fliedner	Route A., Oroville	Cherokee
C. E. Grant	Cherokee, via Oroville	Cherokee
Calaveras County		
Green Mountaine Mine, J. J. McSorley, Mgr.	Mokelumne Hill	Mokelumne Hill
El Dorado County		
D. R. Douglas	580 Market St., San Francisco	
San Bernardino County		
Franklin Heald	Fontana	Victorville
San Diego County		
Pala Chief Gem Mining Co., Frank A. Salmons	U. S. Grant Bldg., San Diego	Pala
Hercules Group, A. W. Pray and E. G. Logan	243 Kansas St., Escondido	
J. W. Ware	1060 6th St., San Diego	Smith Mountain

GRANITE

	Address	Plant
Fresno County		
Academy Granite	Academy	Academy
Grant Rock and Gravel Co.	Box 958, Fresno	Friant
Superior Granite Co., Inc.	Clovis	Academy
Inyo County		
Bly Stone Co. (tuff)	1985 E. 16th St., Los Angeles	Round Valley
Lassen County		
Lassen County	Susanville	Susanville
Los Angeles County		
R. O. Stein Co.	San Gabriel	San Gabriel
Madera County		
McGilvray-Raymond Granite Co.	634 Townsend St., San Francisco	Raymond
Raymond Granite Co., Inc.	3 Potrero Ave., San Francisco	Knowles
Mariposa County		
Kelm Jasper Quarry, H. J. Kelm	Bagby	Bagby
Nevada County		
Netz Granite Quarry, Ludwig Netz	Nevada City	Nevada City
Placer County		
Alexson Granite Co.	Rocklin	Rocklin
Adolph Pernu & Sons	Rocklin	Rocklin
Union Granite Co., Mat Ruhkals	Rocklin	Rocklin
Plumas County		
Paul Sonognini	Chilcoot	Chilcoot
Sacramento County		
Folsom State Prison	Represa	Represa
San Diego County		
Crystal Black Quarry, John Stridsburg	Escondido	Spooks Canyon
McGilvray-Raymond Granite Co.	634 Townsend St., San Francisco	Lakeside
Magee Quarry, Robert J. McGee	Pala	Pala
Meyer Granite Quarry, W. A. Meyer	Lakeside	Lakeside
Simpson-Pirnie Granite Co., Santee Quarry	21st and N Sts., San Diego	----------
Tulare County		
California Granite Co.	Porterville	Porterville

GRAPHITE

	Address	Mine
Los Angeles County		
Verduga Mountain Graphite, Standard Graphite Co.	P. O. Box 338, Glendale	Montrose

GYPSUM

	Address	Quarry
Imperial County		
Pac. Portland Cement	111 Sutter St., San Francisco	Westmoreland
Kern County		
Koehn Gypsum Plant, Chas. Koehn	Saltdale	Saltdale
Riverside County		
E. R. Nonhoff	1116 Ramona St., Corona	Corona
U. S. Gypsum Co.	1105 Edwards & Wildey Bldg., Los Angeles	Blythe

IRON AND TITANIUM

	Address	Mine
Los Angeles County		
Iron Blossom Group	Los Angeles	Lang
Burdick Minerals Corporation	Hermosa Beach	Hermosa Beach

LIME AND LIMESTONE

	Address	Quarry
Contra Costa County		
Mt. Diablo Lime Marl Co.	Ray Bldg., Oakland	Walnut Creek
El Dorado County		
Eldorado Lime and Mining Co.	Shingle Springs	Shingle Springs
Pacific Portland Cement Co.	111 Sutter St., San Francisco	
Inyo County		
Inyo Chemical Co.	1005 Pershing Square Bldg., Los Angeles	Cartago
Kern County		
Summit Lime Plant, Union Lime Co., Lessee	2135 Bay St., Los Angeles	Tehachapi
Los Angeles County		
Torrance Lime and Fertilizer Co.	Torrance	Torrance
Plumas County		
Pyramid Lime Co.	Quincy	Quincy
Riverside County		
San Jacinto Rock Products Co., G. W. Green	San Jacinto	San Jacinto
San Bernardino County		
California Portland Cement Co.	1228 Pac. Mutual Bldg., Los Angeles	Colton
Chas. I. Chubbuck	123 25th Ave., San Francisco	
Pacific Coast Talc Co.	2149 Bay St., Los Angeles	Silver Lake
Victorville Lime Rock Co.	2149 Bay St., Los Angeles	Victorville
San Mateo County		
Pacific Portland Cement Co.	111 Sutter St., San Francisco	San Mateo
Santa Cruz County		
Henry Cowell Lime and Cement Co.	2 Market St., San Francisco	Santa Cruz
Holmes Lime & Cement Co.	2 Pine St., San Francisco	Santa Cruz
Pacific Limestone Products Co.	Spring St., Santa Cruz	Santa Cruz
Santa Cruz Portland Cement Co.	Crocker Bldg., San Francisco	Davenport
Shasta County		
Briggsville Limestone Quarry	Box 604, Redding	Girvan
Tulare County		
Kaweah Quarries	Lemon Cove	Lemon Cove
Abramson & Bode Corp.	Lindsay	Lindsay
Tuolumne County		
Pacific Lime and Plaster Co.	Sonora	Sonora

LITHIA

	Address	Mine
San Diego County		
Stewart Lithia Mine, National Industry Chemical Corp.	Pala, Cal.	Pala

MAGNESITE

	Address	Plant
Los Angeles County		
C. M. Van Orden Co.	128 S. Avenue 64, Los Angeles	----------
San Benito County		
Sampson Magnesite Co.	803 Balfour Bldg., San Francisco	Sampson Pk.
Santa Clara County		
Western Magnesite Mine, C. S. Malty, Lessee	San Francisco	Red Mountain
Stanislaus County		
Red Mtn. Magnesite Co.	906 First Natl. Bank Bldg., San Francisco	Red Mountain
Bald Eagle Magnesite Mine, A. D. Davenport	Gustine	----------
Tulare County		
E. F. Schrei	Lindsay	Lindsay
Sierra Magnesite Co.	233 Sansome St., San Francisco	Porterville

MAGNESIUM SALTS

	Address	Plant
Alameda County		
California Chemical Corp.	233 Sansome St., San Francisco	Newark
Inyo County		
American Magnesium Co.	242 Wilcox Bldg., Los Angeles	Death Valley
San Diego County		
California Chemical Corp.	233 Sansome St., San Francisco	----------

MINERAL PAINT

	Address	Plant
Stanislaus County		
V. J. Winkler	Knights Ferry	----------

MINERAL WATER

	Address	Spring
Butte County		
Polk Springs, Wm. Polk, Mgr.	Chico	Chico
Richardson Springs, Lee Richardson, Mgr.	Chico	Chico
Calaveras County		
Mok-Hill Mineral Spring, Zumwalt, Dahl, Zumwalt	Mokelumne Hill	Mokelumne Hill
Contra Costa County		
Alhambra Springs	Martinez	----------
Fresno County		
Mercey Mineral Springs Co., F. J. Bourn, Pres.	Los Banos	Los Banos
Lake County		
Adams Minerals Springs, Clarence Prather	Adams, via Middletown	Adams
Burt'ett Spring Co.	71 Bluxome St., San Francisco	----------
Norman Medical Springs, H. C. Norman, Mgr.	Middletown	Middletown
Spiers Springs, Joshua Spiers	Middletown	Middletown
Witter Medical Springs	995 Market St., San Francisco	Witter Springs
Los Angeles County		
Holly Springs Water Co.	2284 Holly Drive, Los Angeles	----------
Magnetic Spring Water Co.	936 Palm Ave., Sherman	----------
Mountain Spring Water Co.	226 S. Avenue 54, Los Angeles	----------
Rose Springs-California Spring Water Co.	4835 Pasadena Ave., Los Angeles	----------
Marin County		
Tamalpais Natural Mineral Water Springs, Borello Bros.	San Rafael	----------
Napa County		
G. Musante	Calistoga	Calistoga
Napa Soda Springs Co.	1142 Mission St., San Francisco	----------
Napa Vichy Springs, John Lepori	Napa	----------
Samuels Soda Springs, R. J. Little	Monticello	----------
Riverside County		
Beulah Springs, Oscar C. McNicholl	Arlington	Arlington
San Benito County		
San Benito Min. Spring Co., E. J. Anderson	Box 632, Hollister	----------
San Bernardino County		
Arrowhead Hot Springs Co.	Washington St. and Compton Ave., Los Angeles	Arrowhead
San Diego County		
Buckman Springs	3984 Idaho St., San Diego	----------
El Granito Spring Bottling Co.	472 10th St., San Diego	El Cajon
Rock Springs Co., E. S. Walck	Escondido	Escondido
San Luis Obispo County		
Mary Hill Mineral Well Co., Fred Merckel	Paso Robles	Paso Robles
Santa Barbara County		
Pinkham Mineral Spring Co., R. F. Pinkham	1815 Bath St., Santa Barbara	----------
Veronica Springs Co.	Salsipuedes St., Santa Barbara	----------
Santa Clara County		
San Jose Water Co.	397 N. 2d St., San Jose	----------

MINERAL WATER—Continued

	Address	Spring
Siskiyou County		
Shasta Water Co.	6th and Brannan Sts., San Francisco	Dunsmuir
Yreka Bottling Works	Yreka	Little Shasta
Solano County		
Blue Rock Min. Water Co.	Vallejo	
Sonoma County		
Agua Caliente Springs Co., T. H. Corcoran, Prop.	Agua Caliente	Agua Caliente
Barcal Springs, John Kolling	Preston	Preston
Fetters Mineral Springs, Geo. Fetters	Fetters Springs	Fetters Springs

MARBLE (INCLUDING ONYX AND TRAVERTINE)

	Address	Quarry
Kern County		
Kernville Onyx Quarry	R. F. D. 3, Box 93, Merced	Kernville
Riverside County		
Onyx Mine, A. F. Burke & Son	Whitewater	
Santa Barbara County		
Pacific Gem Co.	3293 Lynwood Rd., Lynwood	Banning
Tuolumne County		
The Columbia Marble Co.	413 Rialto Bldg, San Francisco	Columbia
Solano County		
P. Grassi & Co.	1945 San Bruno Ave., San Francisco	Cement

POTASH

	Address	Plant
San Bernardino County		
American Potash and Chemical Co.	Trona	Trona
Alameda County		
A. A. Oliver, now Leslie California Salt Co.	Mt. Eden	Mt. Eden

PUMICE AND VOLCANIC ASH

	Address	Quarry
Fresno County		
Fort Miller Pumicite, A. H. McKenzie	Guffect-McKenzie Bldg., Fresno	Freant
Imperial County		
Brand & Stevens, Ltd., A. W. Brand	820 N. Michigan Blvd., Chicago, Ill.	Calipatria
Inyo County		
R. J. Fairbanks	Shoshone	Shoshone
R. W. Glendinning	837 Jackson St., Los Angeles	
Red Mountain Cinder Quarry, H. P. Thelan and G. B. Rogers	Coso Junction	Little Lake
Kern County		
Cudahy Packing Co.	803 Macy St., Los Angeles	Ceneda
Mono County		
California Quarries Corp.	1300 Quinby Bldg., Los Angeles	Laws
San Luis Obispo County		
Francis Cleaner Mine, M. L. Francis	R.F.D. 233, Paso Robles	Paso Robles

PYRITE

	Address	Mine
Alameda County		
Leona Chemical Co., D. A. McDonnell	Syndicate Bldg., Oakland	Leona Heights
Mariposa County		
The Floraferro Co.	625 New Call Bldg., San Francisco	Green Mountain
San Benito County		
Antelope Copper Mining Co., H. V. Underwood	Hollister	Antelope District
Shasta County		
Mountain Copper Co.	332 Pine St., San Francisco	Matheson

QUICKSILVER

	Operator	Address	Mine
Lake County			
Abbott Mine	Theo. Smith	521 15th St., Sacramento	Webber Springs
Sulphur Bank Mine	F. W. Bradley	Crocker Bldg., San Francisco	Lower Lake
Monterey County			
Patriquin Mine	Henry J. Bartlett	Crocker Bldg., San Francisco	----------
Napa County			
Aetna Mine	Henry J. Bartlett	Crocker Bldg., San Francisco	Aetna Springs
Ah Lee	----------	Aetna Springs	Aetna Springs
Knoxville Mine	H. W. Gould	Mills Bldg., San Francisco	Knoxville
Manhattan Q. Mine	R. B. Knox, Secy.	Hollister	Knoxville
Oat Hill Mine	Norman E. Livermore	85 2d St., San Francisco	Oat Hill
Orange County			
Red Hill	C. L. McWaters	601 S. Orange St., Santa Ana	Red Hill
San Benito County			
Florence Mac Group	C. P. Smith	Hernandez	Hernandez
New Idria Quicksilver Mines, Inc.	----------	408 Merch. Exchange, San Francisco	Idria
Stayton Quicksilver Mine	R. B. Knox	Hollister	Hollister
San Luis Obispo County			
Klau Mine	Ellard W. Carson	San Luis Obispo	Adelaide
Oceanic Mine	H. W. Gould	Mills Bldg., San Francisco	Cambria
Sonoma County			
Buckeye Mine	C. Baumeister	Cloverdale	Cloverdale
Cloverdale Mine	Cavagnaro & Schor, Lessees	Cloverdale	Cloverdale

SALT

	Address	Plant
Alameda County		
Arden Salt Co.	Newark	Newark
American Salt Co.	781 Green St., San Francisco	Mt. Eden
California et al. Plants, Leslie-California Salt Co.	Alexander Bldg., San Francisco	
Dumbarton Land and Imp. Co.	624 California St., San Francisco	Dumbarton
Pioneer Salt Co.	200 Sacramento St., San Francisco	Alvarado
Kern County		
Consolidated Salt Co.	2456 Enterprise St., Los Angeles	Saltdale
Long Beach Salt Co.	P. O. Box 28, Long Beach	Toby
Los Angeles County		
Long Beach Salt Co.	P. O. Box 28, Long Beach	Long Beach
Modoc County		
Surprise Valley Salt Works, Joshua H. Hutchinson	Box 43, Lake City	Lake City
Mono County		
Wallis D. McPherson	Mono Lake	Mono Lake
Monterey County		
Monterey Bay Salt Co.	Moss Landing	Moss Landing
San Bernardino County		
California Rock Salt Co.	2465 Hunter St., Los Angeles	Amboy
San Mateo County		
Leslie Salt Plant, Leslie-California Salt Co.	Alexander Bldg., San Francisco	Leslie
San Diego County		
Western Salt Co.	P. O. Box 153, San Diego	

SANDSTONE

	Operator	Address	Quarry
Monterey County			
Carmel Stone Quarries		2752 Filbert St., San Francisco	Carmel
Ryon Rock Quarry	C. A. Ryon	Monterey	Monterey
Napa County			
	H. F. Galbeath	2134 Center St., Berkeley	
Santa Barbara County			
Ely Stone Co.		1985 E. 16th St., Los Angeles	
Siskiyou County			
Oberlyn Hill Quarry	J. B. Russell	Yreka	

SHALE OIL

	Address	Plant
Santa Barbara County		
N-T-U Company	643 Call Bldg., San Francisco	Santa Maria

SILICA (SAND and QUARTZ)

	Address	Quarry
Amador County		
Carlisle Clay Co.	Ione	Ione
El Dorado County		
Snow Silica Deposit, Spickey Polish Corp.	1401 3d St., San Francisco	Placerville
Placer County		
Harry McCormick	Alta	Alta
F. R. Payne	Dutch Flat	Dutch Flat
Riverside County		
American Encaustic T. Co.	52d and S. Alameda Sts., Los Angeles	Lakeview
O. W. Blom Co.	Ethanac	Romeland
San Jacinto Rock Producers Co., G. W. Green, Mgr.	Box 496, San Jacinto	San Jacinto
P. J. Weisel	La Habra	----------
San Bernardino County		
Atlas Fire Brick Co.	R.F.D. 2, Box 938, Los Angeles	Hicks

SILLIMANITE-ANDALUSITE-CYANITE GROUP

	Address	Mine
Imperial County		
Vitrefrax Co.	5000 Pacific St., Vernon, Los Angeles	Ogilby
Mono County		
Champion Porcelain Co., Dr. J. A. Jeffery, Pres.	Butler Ave. & Grand Trunk R.R., Detroit, Mich.	Mocalno

SLATE

	Address	Quarry
El Dorado County		
Commercial Mineral Co.	114 Sansome St. San Francisco	Placerville
Mariposa County		
Pacific Slate Co.	Merced	Hornitos
Tuolumne County		
Witney Slate Quarry, John L. Witney	Jamestown	Yosemite Junction

SOAPSTONE and TALC

	Address	Mine
Butte County		
McLean Talc Deposit, W. S. McLean	1919 San Bruno Ave., San Francisco	McLean Spur
Calaveras County		
Commercial Minerals Co.	114 Sansome St., San Francisco	
El Dorado County		
Russi Soapstone Co., A. W. Prouty	Shingle Springs	
Inyo County		
Sierra Talc Co., Franklin Booth, Mgr.	401 Equitable Bank Bldg., Los Angeles	Keeler
Western Talc and Magnesite Co.	Box 461 Arcade Station, Los Angeles	Death Valley
San Bernardino County		
Martin Minerals Co.	Slauson and Alameda Sts., Los Angeles	
Pacific Coast Talc Co.	2149 Bay St., Los Angeles	Silver Lake
Shasta County		
Ganim Mine, Joe Ganim	Redding	

SODA

	Address	Plant
Inyo County		
Clark Chemical Co., Inc.	Bartlett	Bartlett
Natural Soda Products Co.	Bishop	Keeler
Inyo Chemical Co.	1005 Pershing Square Bldg., Los Angeles	Cartago
San Bernardino County		
West End Chemical Co.	West End	Searles Lake

TUNGSTEN

	Address	Mine
San Bernardino County		
Atolia Mining Co.	1022 Crocker Bldg., San Francisco	Atolia
Capatolia Mining Co.	Randsburg	Atolia

STONE, MISCELLANEOUS

Under the heading of Miscellaneous Stone, there are three divisions: Grinding Mill Pebbles, Crushed Rock, and Sand and Gravel.

GRINDING MILL PEBBLES

	Address	Pit
San Diego County		
John T. Momand	Box 281, Carlsbad	Oceanside

CRUSHED ROCK

	Address	Quarry
Alameda County		
Alameda County	Oakland	----------
Central Construction Co., Leona & Heyland Quarry	O. Bank Savings Bldg., Oakland	Oakland
Lake Chabot Quarry, O. F. Chichester	San Leandro	----------
G. & M. Gravel Co.	Livermore Road, Pleasanton	Pleasanton
Kaiser Construction Co.	Amer. Bank Bldg., Oakland	Eliot
Kemper Bros.	Hayward	Hayward
R. P. King	San Lorenzo	San Lorenzo
W. S. McLean, Red Shale Quarry	1919 San Bruno Ave., San Francisco	Mission San Jose
Mtn. View Cemetery Assn.	Oakland	Arroyo Mocho Piedmont
Oakland Paving Co., F. W. Bilger	5000 Broadway, Oakland	----------
Ramos Quarry, Ramos Bros.	C and 7th Sts., Hayward	Hayward
Red Rock Quarry, Manuel Kelly, Supt.	Hayward	Hayward
Russell Bros., Quarry, B. and L. Russell	Hayward	Hayward
Alpine County		
Alpine County	Markleeville	----------
Amador County		
Amador County	Jackson	----------
Stockton Mineral Prod. Co., E. W. True, Mgr.	307 E. Market St., Stockton	Ione
Butte County		
Butte County	Oroville	----------
Coast Rock and Gravel Co.	1000 Hunter-Dulin Bldg., San Francisco	Oroville
Chico Sand, Rock and Gravel Co.	Chico	----------
McLean's Quarry, W. S. McLean	1910 San Bruno Ave., San Francisco	McLean Spur
Calaveras County		
Calaveras County	San Andreas	----------
Angels Greenstone Co.	201 Nevin Ave., Richmond	Angels
Contra Costa County		
Blake Bros. Co., Anson S. Blake	705 Balboa Bldg., San Francisco	----------
Central Constr. Co., C. D. Bates, Mgr.	O. Bank Savings Bldg., Oakland	Siege
Healy, Tibbitts Constr. Co., Chas. C. Horton, Pres.	64 Pine St., San Francisco	Brooks Island Quarry
Hutchinson Co. Richmond Quarry	1706 Broadway, Oakland	----------
Mt. Diablo Lime Marl Co., R. L. Frye	Ray Bldg., Oakland	Walnut Creek
Del Norte County		
Del Norte County	Crescent City	----------
Webber Construction Co., H. Webber	Crescent City	----------
El Dorado County		
El Dorado County	Placerville	----------
Fresno County		
Coast Rock and Gravel Co., Piedra Rock Quarry	500 Call Bldg., San Francisco	Piedra
Southern Calif. Edison Co.	Edison Bldg., Los Angeles	----------
Glenn County		
Glenn County	Willows	----------
Southern Pacific R. R. Co.	S. P. Bldg., San Francisco	----------

CRUSHED ROCK—Continued

	Address	Plant
Humboldt County		
Humboldt County	Eureka	
W. C. Elsmore	332 W. Washington St., Eureka	
Kern Constr. Co., A. D. Kern	Trinidad	Trinidad
Imperial County		
Imperial Irrigation District, Gen. Supt. River Division	Andrade	Andrade
Potholes Granite Quarry, U. S. Bureau of Reclamation	Winterhaven, Yuma, Arizona	
Kern County		
Bakersfield Rock and Gravel Co.	1406 19th St., Bakersfield	
Lassen County		
Lassen County	Susanville	
Los Angeles County		
Bengal & Sons	North Santa Anita St., Pasadena	
Blue Diamond Co.	1650 S. Alameda St., Los Angeles.	
Breslin Greenstone Quarry	Little Rock	Harold
V. E. Britton	Muroco	
Builders Crushed Rock Co.	Azusa	Azuza
Catalina Island Quarry, Graham Bros.	Long Beach	Catalina Island
Consumers Rock and Gravel Co.	2000 S. Alameda St., Los Angeles	
Concrete Material Corp., H. W. Jones	11251 Sherman Way, Los Angeles	
Cooperative Bldg. Material Co.	7855 Santa Monica St., Los Angeles	
Eaton Canyon Rock and Sand Co.	423 Pac. Southwest Bank Bldg., Pasadena	Pasadena
Gorden-Harrison-Russell, Inc.	155 E. Jefferson St., Los Angeles	
Haynes Canyon Rock Co.	Box 48, Tujunga	Tujunga
Rock and Gravel Plants, Los Angeles City	Los Angeles	
Los Angeles Harbor Dept. Co., Bureau of Maintenance	City Hall, San Pedro	Santa Catalina
Livingston Rock and Gravel Co.	Valley Blvd. and Garfield Ave., Alhambra	San Gabriel
Nickel Greenstone Quarry, J. F. Stanford	Little Rock	Harold
Pierson & Son	R. F.D. 1, Box 426, Monrovia	
Preston Rock Quarry, G. W. Preston	Box 165, La Manda Park	Pasadena
Rancho Rock Plant	11970 W. San Fernando St., Burbank	Roscoe
R. O. Stein Co.	San Gabriel	
A., T. & S. F. R. R. Co., I. L. Hibbard, Gen. Mgr.	609 Kerckhoff Bldg., Los Angeles.	
Union Rock Co	1403 E. 16th St., Los Angeles	
Wrigley Co.	Avalon	Catalina Island
Marin County		
Marin County	San Rafael	
Daniels Con. Co.	503 Market St., San Francisco	San Rafael
Brae Quarry, Hutchinson Co.	1706 Broadway, Oakland	San Quentin
Mariposa County		
Kelm Jasper Quarry, H. J. Kelm	Bagby	Bagby
Stockton Mineral Prod. Co.	Stockton	Jasper Station
Yosemite National Park Co., W. B. Lewis, Supt.	Yosemite	
Mendocino County		
Northwestern Pacific R. R. Co.	64 Pine St., San Francisco	
Merced County		
Merced County	Merced	

CRUSHED ROCK—Continued

	Address	Plant
Modoc County		
Nevada-Cal.-Oregon R.R.	Alturas	----------
U. S. Forest Service	Ferry Bldg., San Francisco	----------
Monterey County		
Monterey County	Salinas	----------
Napa County		
Napa County	Napa	----------
Basalt Rock Co.	8th St., Napa	----------
Nevada County		
Nevada County	Nevada City	----------
Orange County		
Orange County	Santa Ana	----------
Union Rock Co.	1403 E. 16th St., Los Angeles	Fullerton
Placer County		
Placer County	Auburn	----------
Alexson Granite Co.	Rocklin	----------
Riverside County		
Blue Diamond Co. Temescal Quarry	Los Angeles	Corona
Bly Bros. & McGillard Co.	311 Grosse Bldg., Los Angeles	Pedley
Ormand Quarry, Hauser Constr. Co.	Security Bldg., Long Beach	Bly Junction
Sacramento County		
Albee Gravel Co.	Perkins	Perkins
Coast Rock and Gravel Co., Fair Oaks Crusher	1000 Hunter-Dulin Bldg., San Francisco	Fair Oaks
Folsom State Prison	Represa	----------
Pratt Rock and Gravel Co.	518 Hearst Bldg., San Francisco	Pratt Rock
San Benito County		
Granite Rock Co.	Drawer M, Watsonville	Logan
San Bernardino County		
A., T. & S. F. R. R. Co., I. L. Hibbard, Gen. Mgr.	609 Kerckhoff Bldg., Los Angeles	----------
Hanawalt Bros.	La Verne	----------
Kennedy Clay Co.	Daggett	----------
Los Angeles & Salt Lake R. R.	Pacific Elec. Bldg., Los Angeles	----------
San Bernardino Rock and Gravel Co.	West 5th St., San Bernardino	----------
Vezu Bros.	Wineville	Declez
San Diego County		
Geo. Daley	4430 Boundary St., San Diego	----------
H. G. Fenton Material Co.	13th St. and Imperial Ave., San Diego	----------
J. W. Grove & Son	3216 I St., San Diego	----------
Simpson-Pirnie Granite Co.	21st and N Sts., San Diego	----------
San Francisco County		
Mission Quarry Co.	210 Balboa Bldg., San Francisco	----------
San Luis Obispo County		
Southern Pacific R. R. Co.	S. P. Bldg., San Francisco	----------
San Mateo County		
San Mateo County	Redwood City	----------
H. E. Casey	3d and B Sts., San Mateo	----------
Daly's Quarry, Market St. R. R. Co.	58 Sutter St., San Francisco	Daly City
Holy Cross Cemetery	Colma	----------
Ratterree Bros. Co.	1208 Market St., San Francisco	South San Francisco

CRUSHED ROCK—Continued

	Address	Plant
Santa Barbara County		
Santa Barbara County	Santa Barbara	
Gates Gravel Plant, Frank H. Gates	Santa Maria	Sisquoc
Midcoast Rock Co., Giovanola & West	19 E. Corrillo St., Santa Barbara	Pt. Honda
Veronica Stone Co.	Veronica Springs, via Santa Barbara	Veronica Sp.
Santa Clara County		
Santa Clara County	San Jose	
G. H. Anderson	Mt. View, Santa Clara County	
Huntchinson Co., Stanford Quarry	1706 Broadway, Oakland	Palo Alto
J. W. Lovejoy	Rt. 1, Box 88, Mt. View	
City of San Jose, Sandpits	San Jose	
Taaffe Construction Co.	Los Altos	
Santa Cruz County		
Pacific Limestone Prod. Co.	Santa Cruz	
Shasta County		
Shasta County	Redding	
Diestelhorst Gravel Plant, Chas. Diestelhorst	Redding	Redding
Pacific Gas & Electric Co., Eng. Dept.	Market St., San Francisco	
Southern Pacific R. R. Co.	S. P. Bldg., San Francisco	
U. S. Forest Service	Ferry Bldg., San Francisco	
Sierra County		
Sierra County	Downieville	
Nevada Construction Co.	Redding	
U. S. Forest Service	Ferry Bldg., San Francisco	
Siskiyou County		
Kaiser Paving Co.	American Bank Bldg., Oakland	
Oberlyn Hill Quarry, J. B. Russell	Yreka	
Southern Pacific R. R. Co.	S. P. Bldg., San Francisco	
U. S. Forest Service	Ferry Bldg., San Francisco	
Solano County		
Solano County	Fairfield	
Cordelia Rock Quarry, E. B. and A. L. Stone Co.	Claus Spreckles Bldg., San Francisco	
Sonoma County		
Sonoma County	Santa Rosa	
Hein Bros. Basalt Rock Co., Mark Hein, Pres.	Petaluma	Petaluma
Mecham Quarry, James Addelman	Petaluma, Star Rt. 1	
Stony Point Quarry, W. A. Wilson.	Petaluma	Stony Point
Stanislaus County		
Atlas Rock Co.	903 Commercial Bank Bldg., Stockton	Orange Blossom
A., T. & S. F. R. R. Co., I. L. Hibbard, Gen. Mgr.	609 Kerckhoff Bldg., Los Angeles.	
Southern Pacific R. R. Co.	S. P. Bldg., San Francisco	
Tehama County		
Tehama County	Red Bluff	
Trinity County		
U. S. Forest Service	Ferry Bldg., San Francisco	
Tulare County		
Tulare County	Visalia	
California Granite Co., C. R. Meil, Pres.	Porterville	Porterville

CRUSHED ROCK—Continued

	Address	Plant
Tuolumne County		
Tuolumne County	Sonora	
Tuolumne Nat. Marble Co., G. Bordoli	Sonora	
McLean Quarry, W. S. McLean	1919 San Bruno Ave., San Francisco	Sonora
Stockton Mineral Products, E. W. True, Mgr.	307 E. Market St., Stockton	

SAND AND GRAVEL

Including Molding Sand

	Address	Plant
Alameda County		
California Rock Co.	Mills Bldg., San Francisco	Pleasanton
Canyon Gravel Co.	Niles	Niles
Coast Rock and Gravel Co.	1000 Hunter-Dulin Bldg., San Francisco	Niles and Eliot
G & M Gravel Co.	Livermore Road, Pleasanton	Pleasanton
Kaiser Construction Co.	American Bank Bldg., Oakland	Eliot
R. P. King	San Lorenzo	San Lorenzo
Langdon Molding Sand, Langdon Bros.	R. F. D., Box 89, Niles	Decoto
Rhodes, Jamison & Co., C. G. Jamison, Gen. Mgr.	Park and Blanding Sts., Oakland	Eliot
E. Stevenson	Centerville	Centerville
Otto Zorns	Newark	Newark
Butte County		
Butte County	Oroville	----------
Coast Rock and Gravel Co.	1000 Hunter-Dulin Bldg., San Francisco	Oroville
De Witt Bros.	Sutter City	----------
Chico Sand, Rock and Gravel Co.	Chico	----------
Contra Costa County		
Antioch Sand Co.	312 Loew Bldg., San Francisco	Antioch
Jacob Bonslett, Oak Point Sand Co.	Antioch	Antioch
Coburn Sand Plant, C. W. Coburn, Jr.	900 O'Farrell St., San Francisco	Antioch
Columbia Steel Co. (molding)	Pittsburg	Pittsburg
E. B. & A. L. Stone Co.	804 Claus Spreckels Bldg., San Francisco	Antioch
Western Rock Products, Morris Sand Pit	Balboa Bldg., San Francisco	Antioch
		----------
Del Norte County		
Del Norte County	Crescent City	----------
El Dorado County		
El Dorado County	Placerville	----------
Fresno County		
Grant Rock and Gravel Co.	Box 958, Fresno	Friant
Service Rock Co.	T. W. Patterson Bldg., Fresno	El Prado
Glenn County		
Glenn County	Willows	----------
Stony Creek Gravel Co., H. S. Twede	Willows	Wyo
Humboldt County		
Humboldt County	Eureka	----------
Arcata Street Supt.	Arcata	----------
Mr. Ferguson	Arcata, R.F.D.	----------
Fortuna Street Supt.	Fortuna	----------
Mercer Fraser Co.	2d and Commercial Sts., Eureka	Essex and Fernbridge
Stout Gravel Pit, W. B. Stout	Dolbeer and Wood Sts., Eureka	----------
Imperial County		
Imperial County, County Clerk	El Centro	----------
Dixieland Gravel Co., B. B. Whitelaw and E. S. Cook	El Centro	Dixieland
S. E. Layman	Holtville	Holtville
Orange County Rock Co.	Niland	Niland
Kern County		
Bakersfield Rock and Gravel Co.	1406 19th St., Bakersfield	----------

SAND AND GRAVEL—Continued

Including Molding Sand

	Address	Plant
Lake County		
Frank H. Merritt, Clerk Bd. of Supervisors	Lakeport	
Lassen County		
Lassen County	Susanville	
Nevada-California-Oregon R. R.	Alturas	
Los Angeles County		
Bengal & Sons	North Santa Anita St., Pasadena	
Blue Diamond Co.	1650 S. Alameda St., Los Angeles	
Builders Crushed Rock Co.	Azusa	Azusa
Concrete Materials Corp., H. W. Jones	11251 Sherman Way, Los Angeles	
Consumers Rock and Gravel Co.	2600 S. Alameda St., Los Angeles	
Cooperative Building Material Co.	7855 Santa Monica St., Los Angeles	
Eaton Canyon Rock and Sand Co.	423 Pac. Southwest Bank Bldg., Pasadena	Pasadena
Graham Bros.	Long Beach	
Gordon-Harrison-Russell, Inc	155 E. Jefferson St., Los Angeles	
C. B. Hallingworth	Box 1003, San Pedro	
Lankershim Sand and Gravel Co.	P. O. Box 1, Lankershim	Lankershim
Livingston Rock and Gravel Co.	Valley Blvd. and Garfield Ave., Alhambra	San Gabriel Canyon
Los Angeles Rock and Gravel Co.	Box 3439, Pasadena Ave., Los Angeles	
Material Dealers Distr. Co.	1000 N. La Brea St., Los Angeles	
Pierson & Son	R.F.D. 1, Box 426, Monrovia	
Preston Rock Quarry, G. W. Preston	Box 165, La Manda Park	
Rancho Rock Plant	11970 W. San Fernando St., Burbank	Roscoe
Reliance Rock Co.	1000 Hunter-Dulin Bldg., San Francisco	Azusa-Kincaid
Edwin Sidebotham & Son	Pennsylvania St., Lomita	Lomita
R. O. Stein Co.	San Gabriel	
Stine & Ellis Rock Prod. Co. W. L. Stine, Pres.	Burbank	Lankershim
Sunset Rock Products Co.	6372 Hollywood Blvd., Los Angeles	
Union Rock Co	1403 E. 16th St., Los Angeles	
Geo. Wiegand	1601 S. Wilson Ave., Alhambra	
Madera County		
Coast Rock and Gravel Co.	1000 Hunter-Dulin Bldg., San Francisco	Solo
Mariposa County		
Yosemite National Park, Col. W. B. Lewis, Supt.	Yosemite	
Merced County		
Merced County	Merced	
Bents Pit Quarry, Bent Bros., Inc.	418 S. Pecan St., Los Angeles	Bents Pit
Hammatt Gravel Plant, V. M. Hammatt	Livingston	
Mono County		
California Quarries Corp.	1300 Quinby Bldg., Los Angeles	Laws
Monterey County		
Bay Development Co., Lapis Sand Plant	153 Berry St., San Francisco	Lapis
Del Monte Properties, A. J. Gunnell	401 Crocker Bldg., San Francisco	Pacific Grove

SAND AND GRAVEL—Continued
Including Molding Sand

	Address	Plant
Monterey County—Continued		
Wm. Machado	Carmel	Carmel
Monterey Sand Co.	Monterey	Monterey
Pratt Bldg. Materials Co., Chas. F. Pratt, Gen. Mgr.	Hearst Bldg., San Francisco	
Napa County		
John Cassaretto	345 Berry St., San Francisco	
Napa County	Napa	
Thornsen Gravel Pit, Harry Thornsen	St. Helena	St. Helena
Joseph Botali	St. Helena	
Weinberger Gravel Pit, Mrs. H. E. Weinberger	St. Helena	St. Helena
Orange County		
W. Brady	R.F.D. 2, Orange	
A. J. Jorgensen	Garden Grove	
Lindauer & Sons	200 W. Central Ave., La Habra	La Habra
Orange County Brick and Tile Co.	120 W. Commonwealth St., Fullerton	Anaheim
Sparkes & McClellan	813 E. Center St., Anaheim	Olive
Union Rock Co.	1403 E. 16th St., Los Angeles	Fullerton
Placer County		
J. A. Pobles	Applegate	
Riverside County		
Nevada-Pacific Minerals Co.	535 Rives-Strong Bldg., Los Angeles	Jurupa Station
Sacramento County		
Albee Gravel Co.	Perkins	Perkins
Bay Development Co., E. H. Rix, Secretary	153 Berry St., San Francisco	
Cannon & Co. (molding)	Box 281, Sacramento	Ben Ali
Capital Sand and Gravel Co.	R.F.D. 3, Box 100, 12th St. Road, Sacramento	Amer. River
Construction Materials Co.	24th St., Sacramento	Amer. River
Coast Rock and Gravel Co., Fair Oaks Crusher	1000 Hunter-Dulin Bldg., San Francisco	Fair Oaks
Cutter Rock and Sand Co.	1401 39th St., Sacramento	
Pratt Building Material Co., Clarence F. Pratt, Gen. Mgr.	Hearst Bldg., San Francisco	
Rhodes, Jamieson & Co., G. G. Jamieson, Gen. Mgr.	Park and Blanding Sts., Oakland.	
San Benito County		
San Benito County	Hollister	
Granite Rock Co.	Drawer M, Watsonville	Logan
San Bernardino County		
Hanawalt Bros.	La Verne	
San Bernardino Rock and Gravel Co.	West 5th St., San Bernardino	
Triangle Rock and Gravel Co.	San Bernardino	
Wm. Truscott	San Bernardino	
San Diego County		
Bulner & Murphy Rock Plant	San Diego	
Geo. Daley	4430 Boundary St., San Diego	
H. G. Fenton Material Co.	13th and Imperial Ave., San Diego	
J. W. Grove & Son	3216 I St., San Diego	
F. L. Hieatt	P. O. Box 865, San Diego	
R. M. Hubbard	406 W. Nutmeg St., San Diego	
Jones & Klinger, E. J. Klinger	Mission Valley, San Diego	
Nelson & Sloan	Chula Vista	

SAND AND GRAVEL—Continued

Including Molding Sand

	Address	Plant
San Francisco County		
Industrial Mineral Products, W. B. Vestal, Pres.	970 7th St., San Francisco	
San Joaquin County		
Santa Fe Sand and Gravel Co., W. A. Arington	P. O. Box 271, Escalon	Escalon
Western Pacific R. R. Co., E. W. Mason, Gen. Supt.	Mills Bldg., San Francisco	
San Luis Obispo County		
Guiton Molding Sand, Harold E. Guiton	Oceano	Oceano
Granite Rock Co., Templeton Sand Plant	Drawer M, Watsonville	Templeton
San Mateo County		
San Mateo County	Redwood City	
H. E. Casey Co.	3d and B Sts., San Mateo	
Daly's Quarry, Market St. R. R. Co.	58 Sutter St., San Francisco	
Santa Barbara County		
Gates Gravel Plant, Frank H. Gates	Santa Maria	Sisquoc
Lompoc, P. C. Schuck, Street Supt.	Lompoc	
Santa Clara County		
Bay Development Co., Coyote Gravel Plant	153 Berry St., San Francisco	
Beasworrick Gravel Pit, Beasworrick Bros.	75 W. Howe St., San Jose	San Jose
Bright Gravel Co., Wm. H. Bright	57 W. Santa Clara St., San Jose	Senter Road
Carroll Gravel Pit, R. D. Carroll	950 S. 6th St., San Jose	San Jose
Chas. W. Hamilton	South 14th St., San Jose	San Jose
A. G. Jahn	Rt. C, Box 362, San Jose	San Jose
Jas. A. Lemieux	Box 110 Senter Rd., San Jose	San Jose
Los Gatos Sand	Los Gatos	Los Gatos
Montoya Gravel Pit, M. Montoya	351 Keyes St., San Jose	Coyote Creek
Prentiss Paving Co.	4th and Keys St., San Jose	San Jose
Raisch Imp. Co.	32 E. San Antonio St., San Jose	Coyote Creek
City of San Jose Sand Pits	San Jose	
Santa Clara Gravel Co.	Campbell	Campbell
Santa Cruz County		
Santa Cruz County	Santa Cruz	
Felton Sand and Gravel Co., J. O. Gaumer, Gen. Mgr.	300 Burrel Bldg., San Jose	Felton
Geyer Gravel Plant, J. C. Geyer	Santa Cruz	
Shasta County		
Shasta County	Redding	
Diestelhorst Gravel Plant, Chas. Diestelhorst	Redding	Redding
Crews Gravel Pit, Phillip Crews	17 N. Pine St., Redding	Sacramento River
Siskiyou County		
Hydraulic Stone and Brick Co., A. F. Graham	Klamath Falls, Oregon	Hoey
Sonoma County		
Sonoma County	Santa Rosa	
Helberg Gravel Plant	Shellville	Shellville
Hotchkiss Gravel Plant	Sotoyome District, via Healdsburg	

SAND AND GRAVEL—Continued
Including Molding Sand

	Address	Plant
Sonoma County—Continued		
Independent Gravel Co.	Forestville	Forestville
Mirabel Gravel Co.	Forestville	----------
Russian River Gravel Co., J. D Grant, Mgr.	Healdsburg	Healdsburg
Stanislaus County		
Atlas Rock Co.	903 Commercial Bank Bldg., Stockton	Orange Blossom
Crows Landing, Frank B. Marks	Newman	Crows Landing
Modesto Sand Pit	City Hall, Modesto	Modesto
Oakdale Irrigation District, M. E. Robinson	Oakdale	----------
Rinehart Bros., Rinehart Sand Pit	Modesto	----------
Scanlon Gravel Plant, J. P. Scanlon	Patterson	Crows Landing
Stewart Gravel Pit, John Stewart	Crows Landing	Crows Landing
Tuolumne River Gravel Pit, Service Bros.	Waterford	Waterford
Tehama County		
Tehama County	Red Bluff	----------
Trinity County		
Trinity County	Weaverville	----------
Tuolumne County		
Tuolumne County	Sonora	----------
Ventura County		
County Surveyor	Ventura	----------
Saticoy Rock Products Co.	Saticoy	Saticoy-Ventura
Ventura Velvet Molding Sand, Chas. A. Cole	1723 Church St., Ventura	Ventura
Yolo County		
County Engineer, Yolo County	Woodland	----------
Yolo Gravel Co.	P. O. Box 7, Yolo	----------
Yuba County		
Hemstreet & Bell	411 C St., Marysville	Yuba County
Marysville Sand Co., Inc., G. J. Hoffman	Marysville	----------
Pratt Building Material Co., Clarence F. Pratt, Gen. Mgr.	Hearst Bldg., San Francisco	----------
Yuba River Sand Plant, Coast Rock and Gravel Co.	New Call Bldg., San Francisco	Marysville

NOTE.—The California State Highway Commission produces both crushed rock and sand and gravel in various places in the state used in construction and maintenance of highways.

APPENDIX B.

MINING BUREAU ACT.

Chapter 679.

[Stats. 1913.]

An act establishing a state mining bureau, creating the office of state mineralogist, fixing his salary and prescribing his powers and duties; providing for the employment of officers and employees of said bureau, making it the duty of persons in charge of mines, mining operations and quarries to make certain reports, providing for the investigation of mining operations, dealings and transactions and the prosecution for defrauding, swindling and cheating therein, creating a state mining bureau fund for the purpose of carrying out the provisions of this act and repealing an act entitled "An act to provide for the establishment, maintenance, and support of a bureau, to be known as the state mining bureau, and for the appointment and duties of a board of trustees, to be known as the board of trustees of the state mining bureau, who shall have the direction, management and control of said state mining bureau, and to provide for the appointment, duties, and compensation of a state mineralogist, who shall perform the duties of his office under the control, direction and supervision of the board of trustees of the state mining bureau," approved March 23, 1893, and all acts amendatory thereof and supplemental thereto or in conflict herewith.

[Approved June 16, 1913. In effect August 10, 1913.]

The people of the State of California do enact as follows:

SECTION 1. There is hereby created and established a state mining bureau. The chief officer of such bureau shall be the state mineralogist, which office is hereby created.

SEC. 2. It shall be the duty of the governor of the State of California and he is hereby empowered to appoint a citizen and resident of this state, having a practical and scientific knowledge of mining, to the office of state mineralogist. Said state mineralogist shall hold his office at the pleasure of the governor. He shall be a civil executive officer. He shall take and subscribe the same oath of office as other state officers. He shall receive for his services a salary of three hundred dollars ($300) per month, to be paid at the same time and in the same manner as the salaries of other state officers. He shall also receive his necessary traveling expenses when traveling on the business of his office. He shall give bond for the faithful performance of his duties in the sum of ten thousand dollars ($10,000), said bond to be approved by the governor of the State of California.

SEC. 3. Said state mineralogist shall employ competent geologists, field assistants, qualified specialists and office employees when necessary in the execution of his plans and operations of the bureau, and fix their compensation. The said employees shall be allowed their necessary traveling expenses when traveling on the business of said department and shall hold office at the pleasure of said state mineralogist.

SEC. 4. It shall be the duty of said state mineralogist to make, facilitate, and encourage, special studies of the mineral resources and mineral industries of the state. It shall be his duty: to collect statistics concerning the occurrence and production of the economically important minerals and the methods pursued in making their valuable constituents available for commercial use; to make a collection of typical geological and mineralogical specimens, especially those of economic and commercial importance, such collection constituting the museum of the state mining bureau; to provide a library of books, reports, drawings, bearing upon the mineral industries, and sciences of mineralogy and geology, and arts of mining and metallurgy, such library constituting the library of the state mining bureau; to make a collection of models, drawings and descriptions of the mechanical appliances used in mining and metallurgical processes; to preserve and so maintain such collections and library as to make them available for reference and examination, and open to public inspection at reasonable hours; to maintain, in effect, a bureau of information concerning the mineral industries of this state, to consist of such collections and library, and to arrange, classify, catalogue, and index the data therein contained, in a manner to make the information available to those desiring it; to issue from time to time such bulletins as he may deem advisable concerning the statistics and technology of the mineral industries of this state.

SEC. 5. It is hereby made the duty of the owner, lessor, lessee, agent, manager or other person in charge of each and every mine, of whatever kind or character, within the state, to forward to the state mineralogist, upon his request, at his office not later than the thirtieth day of June, in each year, a detailed report upon forms which will be furnished showing the character of the mine, the number of men then employed, the method of working such mine and the general condition thereof, the total mineral production for the past year, and such owner, lessor, lessee, agent, manager or other person in charge of any mine within the state must furnish whatever information relative to such mine as the state mineralogist may from time to time require for the proper discharge of his official duties. Any owner, lessor, lessee, agent, manager or other person in charge of each and every mine, of whatever kind or character within the state, who fails to comply with the above provisions shall be deemed guilty of a misdemeanor.*

SEC. 6. The state mineralogist now performing the duties of the office of state mineralogist shall perform the duties of the office of state mineralogist as in this act provided until the appointment and qualification of his successor as in this act provided.

SEC. 7. The said state mineralogist shall take possession, charge and control of the offices now occupied and used by the board of trustees and state mineralogist and the museum, library and laboratory of the mining bureau located in San Francisco as provided for by a certain act of the legislature approved March 23, 1893, and hereafter referred to in section fourteen hereof, and shall maintain such offices, museum, library and laboratory for the purposes provided in this act.

SEC. 8. Said state mineralogist or qualified assistant shall have full power and authority at any time to enter or examine any and all mines, quarries, wells, mills, reduction works, refining works and other mineral properties or working plants in this state in order to gather data to comply with the provisions of this act.

SEC. 9. The state mineralogist shall make a biennial report to the governor on or before the fifteenth day of September next preceding the regular session of the legislature.

SEC. 10. All moneys received by the state mining bureau or any officer thereof (except such as may be paid to them by the state for disbursement) shall be receipted for by the state mineralogist or other officer authorized by him to act in his place and at least once a month accounted for by him to the state controller and paid into the state treasury to the credit of a fund which is hereby created and designated "state mining bureau fund." All moneys now in the possession of the state mining bureau or any officer thereof received from any source whatsoever, shall be immediately paid over to the state mineralogist and by him accounted for to the controller and paid into the state treasury to the credit of said fund. Said fund shall be used and is hereby appropriated for the use of said bureau in carrying out the purposes of this act.

SEC. 11. The said state mineralogist is hereby authorized and empowered to receive on behalf of this state, for the use and benefit of the state mining bureau, gifts, bequests, devises and legacies of real or other property and to use the same in accordance with the wishes of the donors, and if no instructions are given by said donors, to manage, use, and dispose of the gifts and bequests and legacies for the best interests of said state mining bureau and in such manner as he may deem proper.

SEC. 12. The state mineralogist may, whenever he deems it advisable, prepare a special collection of ores and minerals of California to be sent to or used at any world's fair or exposition in order to display the mineral wealth of the state.

SEC. 13. The state mineralogist is hereby empowered to fix a price upon and to dispose of to the public, at such price, any and all publications of the state mining bureau, including reports, bulletins, maps, registers or other publications, such price shall approximate the cost of publication and distribution. Any and all sums derived from such disposition, or from gifts or bequests made, as hereinbefore provided must be accounted for by said state mineralogist and turned over to the state treasurer to be credited to the mining bureau fund as provided for in section ten. He is also empowered to furnish without cost to public libraries the publications of the bureau and to exchange publications with other geological surveys and scientific societies, etc.

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*Sec. 19 of the Penal Code of California provides: "Except in cases where a different punishment is prescribed by this code, every offense declared to be a misdemeanor is punishable by imprisonment in a county jail not exceeding six months, or by a fine not exceeding five hundred dollars, or by both."

SEC. 14. The state mineralogist provided for by this act shall be the successor in interest of the board of trustees of the state mining bureau, and the state mineralogist, under and by virtue of that certain act, entitled "An act to provide for the establishment, maintenance, and support of a bureau, to be known as the state mining bureau, and for the appointment and duties of a board of trustees, to be known as the board of trustees of the state mining bureau, who shall have the direction, management, and control of said state mining bureau, and to provide for the appointment, duties, and compensation of a state mineralogist, who shall perform the duties of his office under the control, direction and supervision of the board of trustees of the state mining bureau," approved March 23, 1893, and all books, papers, documents, personal property, records, and property of every kind and description obtained or possessed, or held or controlled by the said board of trustees of the said state mining bureau, and the state mineralogist, and the clerks and employees thereof, under the provisions of said act of March 23, 1893, or any act supplemental thereto or amendatory thereof, shall immediately be turned over and delivered to the said state mineralogist herein provided for, who shall have charge and control thereof.

SEC. 15. That certain act entitled "An act to provide for the establishment, maintenance, and support of a bureau, to be known as the state mining bureau, and for the appointment and duties of a board of trustees, to be known as the board of trustees of the state mining bureau, and to provide for the appointment, duties and compensation of a state mineralogist, who shall perform the duties of his office under the control, direction, and supervision of the board of trustees of the state mining bureau," approved March 23, 1893, together with all acts amendatory thereof and supplemental thereto and all acts in conflict herewith are hereby repealed.

DEPARTMENT OF NATURAL RESOURCES ACT.

Chapter 128.

[Stats. 1927.]

An act to add a new article to chapter three of title one of part three of the Political Code to be numbered article two j, embracing sections three hundred seventy-three to three hundred seventy-three i, relating to a department of natural resources.

[Approved by the Governor April 13, 1927.]

The people of the State of California do enact as follows:

SECTION 1. The Political Code is hereby amended by adding a new article to chapter III of title I of part III thereof, to be numbered article II*j*, embracing sections 373 to 373*i* and to read as follows:

ARTICLE II*j*.

DEPARTMENT OF NATURAL RESOURCES.

373. A department of the government of the State of California to be known as the department of natural resources is hereby created. The department shall be conducted under the control of an executive officer to be known as the director of natural resources, which office is hereby created. The director shall be appointed by and hold office at the pleasure of the governor and shall receive a salary of six thousand dollars per annum.

Except as in this article otherwise provided, the provisions of article II of this chapter, title, and part of the Political Code as adopted at the forty-fourth session of the Legislature and as the same may be amended from time to time, shall govern and apply to the conduct of the department of natural resources in every respect the same as if such provisions were herein set forth at length and wherever in said article II the term "head of the department" or similar designation occurs, the same shall for the purposes of this article mean the director of natural resources.

373*a*. For purposes of administration the department shall be forthwith organized by the director thereof, subject to the approval of the governor, in such manner as he shall deem necessary to properly segregate and conduct the work of the department, and the director shall have power to appoint in accordance with the civil service and other provisions of law such deputies, officers and other expert and clerical assistants as may be necessary. The work of the department is hereby divided into at least four divisions to be known as the division of mines and mining, the division of forestry, the divison of parks and the division of fish and game.

373*b*. The division of mines and mining shall be administered through a chief of division who shall also be known as the state mineralogist. He shall be appinted by the director of natural resources and shall receive a salary of six thousand dollars per annum.

373*c*. The division of forestry shall be administered through a chief of division who shall be known as the state forester, who shall be a technically trained forester, appointed by the director of natural resources upon nomination by the state board of forestry hereinafter provided. General policies for the guidance of the division of forestry shall be determined by a state board of forestry which shall consist of seven members appointed by and holding office at the pleasure of the governor. Of the seven members one shall be familiar with the pine timber industry, one with the redwood industry, one with the live stock industry, one with general agriculture and one with the problems of water conservation.

373*d*. The division of parks shall be administered through a chief of division who shall be appointed by the director of natural resources upon nomination by the state park commission hereinafter provided. General policies for the administration of the state park system shall be determined by the state park commission which is hereby created to consist of five members appointed by the governor and holding office at his pleasure.

373*e*. The division of fish and game shall be administered through a fish and game commission consisting of three members appointed by and holding office at the pleasure of the governor.

373*f*. The chiefs of the divisions of forestry and parks respectively shall receive such salaries as may be determined by the director with the approval of the governor. The director of natural resources and the chief of each division before entering upon his duties shall execute to the State of California an official bond in the penal sum of twenty-five thousand dollars conditioned upon the faithful performance of his duties. The members of the board of forestry, the state parks commission and fish and game commission shall serve without compensation, but shall be entitled to their actual expenses incurred in the performance of their duties.

373*g*. The department of natural resources shall succeed to and is hereby invested with all the duties, powers, purposes, responsibilities and jurisdiction of the state mining bureau, state mineralogist, department of petroleum and gas, state oil and gas supervisor, state forester, state board of forestry, California redwood park commission, San Pasqual battlefield commission, Mount Diablo park commission, state fish and game commission, state fish and game commissioners, and, except as herein otherwise provided, of the several officers, deputies and employees of such bodies and offices, and whenever by the provisions of any statute or law now in force or that may hereafter be enacted a duty or jurisdiction is imposed or authority conferred upon any of said officers, offices, bodies, deputies or employees by any statute the enforcement of which is transferred to the department, such duty, jurisdiction and authority are hereby imposed upon and transferred to the department of natural resources and the appropriate officers thereof with the same force and effect as though the title of said department of natural resources had been specifically set forth and named therein in lieu of the name of any such body, office, officer, deputy or employee. Said bodies and offices, the duties, powers, purposes, responsibilities and jurisdiction of which are so transferred and vested in the department of natural resources, and the positions of all officers, deputies and employees thereunder, are and each of them is hereby abolished and shall have no further legal existence, but the statutes and laws under which they existed and all laws prescribing their duties, powers, purposes, responsibilities and jurisdiction, together with all lawful rules and regulations established thereunder are hereby expressly continued in force.

The department of natural resources shall be in possession and control of all records, books, papers, offices, equipment, supplies, moneys, funds, appropriations, land and other property real or personal now or hereafter held for the benefit or use of said bodies, offices and officers.

The boards of district oil and gas commissioners, the offices of district oil and gas commissioners and the board of review, correction and equalization created by the act aproved June 10, 1915, establishing the department of petroleum and gas, are hereby respectively continued in force with the powers, duties, responsibilities and jurisdiction in them vested by the provisions of said act approved June 10, 1915, as amended; *provided*, that said board of review shall consist of the director of natural resources, the director of finance and the chairman of the state board of equalization.

373*h*. The management and control of the property acquired by the State of California under or pursuant to the provisions of the act entitled "An act to accept the gift to the state of San Pasqual battlefield in San Diego county, to provide for collecting and systematizing the history of said battle, for determining the exact location thereof, and to report a suitable method of marking said battlefield and commemorating the heroism of those Americans who fought and died there," approved May 11, 1919, is hereby transferred to and vested in the department of natural resources.

373*i*. From and after the date upon which this act takes effect, the department of natural resources shall be and is hereby authorized and empowered to expend the moneys in any appropriation or in any special fund in the state treasury now remaining or made available by law for the administration of the provisions of all the statutes the administration of which is committed to the department, or for the use, support, or maintenance of any board, bureau, commission, department, office or officer whose duties, powers, and functions are, by the provisions of this article, transferred to and conferred upon the department of natural resources. Such expenditures by the department shall be made in accordance with law in carrying out the purposes for which such appropriations were made or such special funds created.

PUBLICATIONS OF THE DIVISION OF MINES AND MINING

During the past forty-eight years, in carrying out the provisions of the organic act creating the former California State Mining Bureau, there have been published many reports, bulletins and maps which go to make up a library of detailed information on the mineral industry of the state, a large part of which could not be duplicated from any other source.

One feature that has added to the popularity of the publications is that many of them have been distributed without cost to the public, and even the more elaborate ones have been sold at a price which barely covers the cost of printing.

Owing to the fact that funds for the advancing of the work of this department have often been limited, many of the reports and bulletins mentioned were printed in limited editions which are now entirely exhausted.

Copies of such publications are available, however, in the office of the Division of Mines and Mining, in the Ferry Building, San Francisco; New Orpheum Building, Los Angeles; State Office Building, Sacramento; Redding; Santa Maria; Santa Paula; Coalinga; Taft; Bakersfield. They may also be found in many public, private and technical libraries in California and other states, and foreign countries.

A catalog of all publications from 1880 to 1917, giving a synopsis of their contents, is issued as Bulletin No. 77.

Publications in stock may be obtained by addressing any of the above offices and enclosing the requisite amount in the case of publications that have a list price. Only coin, stamps or money orders should be sent, and it will be appreciated if remittance is made in this manner rather than by personal check.

The prices noted include delivery charges to all parts of the United States. Money orders should be made payable to the Division of Mines and Mining.

NOTE.—The Division of Mines and Mining frequently receives requests for some of the early Reports and Bulletins now out of print, and it will be appreciated if parties having such publications and wishing to dispose of them will advise this office.

REPORTS

Asterisks (**) indicate the publication is out of print.

	Price
**First Annual Report of the State Mineralogist, 1880, 43 pp. Henry G. Hanks	----
**Second Annual Report of the State Mineralogist, 1882, 514 pp., 4 illustrations, 1 map. Henry G. Hanks	----
**Third Annual Report of the State Mineralogist, 1883, 111 pp., 21 illustrations. Henry G. Hanks	----
**Fourth Annual Report of the State Mineralogist, 1884, 410 pp., 7 illustrations. Henry G. Hanks	----
**Fifth Annual Report of the State Mineralogist, 1885, 234 pp., 15 illustrations, 1 geological map. Henry G. Hanks	----
**Sixth Annual Report of the State Mineralogist, Part I, 1886, 145 pp., 3 illustrations, 1 map. Henry G. Hanks	----
**Part II, 1887, 222 pp., 36 illustrations. William Irelan, Jr.	----
**Seventh Annual Report of the State Mineralogist, 1887, 315 pp. William Irelan, Jr.	----

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	Price
**Eighth Annual Report of the State Mineralogist, 1888, 948 pp., 122 illustrations. William Irelan, Jr.	----
**Ninth Annual Report of the State Mineralogist, 1889, 352 pp., 57 illustrations, 2 maps. William Irelan, Jr.	----
**Tenth Annual Report of the State Mineralogist, 1890, 983 pp., 179 illustrations, 10 maps. William Irelan, Jr.	----
Eleventh Report (First Biennial) of the State Mineralogist, for the two years ending September 15, 1892, 612 pp., 73 illustrations, 4 maps. William Irelan, Jr.	$1.00
**Twelfth Report (Second Biennial) of the State Mineralogist, for the two years ending September 15, 1894, 541 pp., 101 illustrations, 5 maps. J. J. Crawford	----
**Thirteenth Report (Third Biennial) of the State Mineralogist, for the two years ending September 15, 1896, 726 pp., 93 illustrations, 1 map. J. J. Crawford	----
Chapters of the State Mineralogist's Report, Biennial Period, 1913–1914, Fletcher Hamilton:	
**Mines and Mineral Resources, Amador, Calaveras and Tuolumne Counties, 172 pp., paper	----
Mines and Mineral Resources, Colusa, Glenn, Lake, Marin, Napa, Solano, Sonoma and Yolo Counties, 208 pp., paper	.50
Mines and Mineral Resources, Del Norte, Humboldt, and Mendocino Counties, 59 pp., paper	.25
**Mines and Mineral Resources, Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin and Stanislaus Counties, 220 pages, paper	----
Mines and Mineral Resources of Imperial and San Diego Counties, 113 pp., paper	.35
**Mines and Mineral Resources, Shasta, Siskiyou and Trinity Counties, 180 pp., paper	----
**Fourteenth Report of the State Mineralogist, for the Biennial Period 1913–1914, Fletcher Hamilton, 1915:	
A General Report on the Mines and Mineral Resources of Amador, Calaveras, Tuolumne, Colusa, Glenn, Lake, Marin, Napa, Solano, Sonoma, Yolo, Del Norte, Humboldt, Mendocino, Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, San Diego, Imperial, Shasta, Siskiyou, and Trinity Counties, 974 pp., 275 illustrations, cloth	----
Chapters of the State Mineralogist's Report, Biennial Period, 1915–1916, Fletcher Hamilton:	
**Mines and Mineral Resources, Alpine, Inyo and Mono Counties, 176 pp., paper	----
**Mines and Mineral Resources, Butte, Lassen, Modoc, Sutter, and Tehama Counties, 91 pp., paper	----
Mines and Mineral Resources, El Dorado, Placer, Sacramento, and Yuba Counties, 198 pp., paper	.65
Mines and Mineral Resources, Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura Counties, 183 pp., paper	.65
Mines and Mineral Resources, Los Angeles, Orange, and Riverside Counties, 136 pp., paper	.50
**Mines and Mineral Resources, San Bernardino and Tulare Counties, 186 pp., paper	----
**Fifteenth Report of the State Mineralogist, for the Biennial Period 1915–1916, Fletcher Hamilton, 1917:	
A General Report on the Mines and Mineral Resources of Alpine, Inyo, Mono, Butte, Lassen, Modoc, Sutter, Tehama, Placer, Sacramento, Yuba, Los Angeles, Orange, Riverside, San Benito, San Luis Obispo, Santa Barbara, Ventura, San Bernardino and Tulare Counties, 990 pp., 413 illustrations, cloth	----
Chapters of the State Mineralogist's Report, Biennial Period 1917–1918, Fletcher Hamilton:	
Mines and Mineral Resources of Nevada County, 270 pp., paper	.75
Mines and Mineral Resources of Plumas County, 188 pp., paper	.50
Mines and Mineral Resources of Sierra County, 144 pp., paper	.50

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	Price
Seventeenth Report of the State Mineralogist, 1920, Mining in California during 1920, Fletcher Hamilton: 562 pp., 71 illustrations, cloth	1.75
Eighteenth Report of the State Mineralogist, 1922, Mining in California, Fletcher Hamilton. Chapters published monthly beginning with January, 1922:	
**January, **February, March, April, May, June, July, August, September, October, November, December, 1922	Free
Chapters of Nineteenth Report of the State Mineralogist, 'Mining in California,' Fletcher Hamilton and Lloyd L. Root. January, February, March, September, 1923	Free
Chapters of Twentieth Report of the State Mineralogist, 'Mining in California,' Lloyd L. Root. Published quarterly. January, April, **July, October, 1924, per copy	$0.25
Chapters of Twenty-first Report of the State Mineralogist, 'Mining in California,' Lloyd L. Root. Published quarterly.	
January, 1925, Mines and Mineral Resources of Sacramento, Monterey and Orange counties	.25
April, 1925, Mines and Mineral Resources of Calaveras, Merced, San Joaquin, Stanislaus and Ventura counties	.25
July, 1925, Mines and Mineral Resources of Del Norte, Humboldt and San Diego counties	.25
October, 1925, Mines and Mineral Resources of Siskiyou, San Luis Obispo and Santa Barbara counties	.25
Subscription, $1.00 in advance (by calendar year, only).	
Chapters of Twenty-second Report of the State Mineralogist, 'Mining in California,' Lloyd L. Root. Published quarterly.	
January, 1926, Mines and Mineral Resources of Trinity and Santa Cruz counties	.25
April, 1926, Mines and Mineral Resources of Shasta, San Benito and Imperial counties	.25
July, 1926, Mines and Mineral Resources of Marin and Sonoma Counties	.25
October, 1926, Mines and Mineral Resources of El Dorado and Inyo counties, also report on Minaret District, Madera County	.25
Chapters of Twenty-third Report of the State Mineralogist, 'Mining in California,' Lloyd L. Root. Published quarterly.	
January, 1927, Mines and Mineral Resources of Contra Costa County; Santa Catalina Island	.25
April, 1927, Mines and Mineral Resources of Amador and Solano counties	.25
July, 1927, Mines and Mineral Resources of Placer and Los Angeles counties	.25
October, 1927, Mines and Mineral Resources of Mono County	.25
Chapters of Twenty-fourth Report of the State Mineralogist, 'Mining in California,' Lloyd L. Root. Published quarterly.	
January, 1928, Mines and Mineral Resources of Tuolumne County	.25
April, 1928, Mines and Mineral Resources of Mariposa County	.25
July, 1928, Mines and Mineral Resources of Butte and Tehama Counties	.25
October, 1928, Mines and Mineral Resources of Plumas and Madera Counties	.25
Chapters of State Oil and Gas Supervisor's Report:	
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Summary of Operations—California Oil Fields. Published monthly, beginning April, 1919:	
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BULLETINS

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**Bulletin No. 2. Methods of Mine Timbering, by W. H. Storms. 1894, 58 pp., 75 illustrations ---- ----
**Bulletin No. 3. Gas and Petroleum Yielding Formations of Central Valley of California, by W. L. Watts. 1894, 100 pp., 13 illustrations, 4 maps ---- ----
**Bulletin No. 4. Catalogue of Californian Fossils, by J. G. Cooper, 1894, 73 pp., 67 illustrations. (Part I was published in the Seventh Annual Report of the State Mineralogist, 1887.) ---- ----
**Bulletin No. 5. The Cyanide Process, 1894, by Dr. A. Scheidel. 140 pp., 46 illustrations ---- ----
Bulletin No. 6. California Gold Mill Practices, 1895, by E. B. Preston. 85 pp., 46 illustrations ---- $0.50
**Bulletin No. 7. Mineral Production of California, by Counties for the year 1894, by Charles G. Yale. Tabulated sheet ---- ----
**Bulletin No. 8. Mineral Production of California, by Counties for the year 1895, by Charles G. Yale. Tabulated sheet ---- ----
**Bulletin No. 9. Mine Drainage, Pumps, etc., by Hans C. Behr. 1896, 210 pp., 206 illustrations ---- ----
**Bulletin No. 10. A bibliography Relating to the Geology, Palæontology and Mineral Resources of California, by Anthony W. Vogdes. 1896, 121 pp. ---- ----
**Bulletin No. 11. Oil and Gas Yielding Formations of Los Angeles, Ventura and Santa Barbara counties, by W. L. Watts. 1897, 94 pp., 6 maps, 31 illustrations ---- ----
**Bulletin No. 12. Mineral Production of California, by Counties for 1896, by Charles G. Yale. Tabulated sheet ---- ----
**Bulletin No. 13. Mineral Production of California, by Counties for 1897, by Charles G. Yale. Tabulated sheet ---- ----
**Bulletin No. 14. Mineral Production of California, by Counties for 1898, by Charles G. Yale ---- ----
**Bulletin No. 15. Map of Oil City Fields, Fresno County, by John H. Means. 1899 ---- ----
**Bulletin No. 16. The Genesis of Petroleum and Asphaltum in California, by A. S. Cooper. 1899, 39 pp., 29 illustrations ---- ----
**Bulletin No. 17. Mineral Production of California, by Counties for 1899, by Charles G. Yale. Tabulated sheet ---- ----
**Bulletin No. 18. Mother Lode Region of California, by W. H. Storms. 1900, 154 pp., 49 illustrations ---- ----
**Bulletin No. 19. Oil and Gas Yielding Formations of California, by W. L. Watts. 1900, 236 pp., 60 illustrations, 8 maps ---- ----
**Bulletin No. 20. Synopsis of General Report of State Mining Bureau, by W. L. Watts. 1901, 21 pp. This bulletin contains a brief statement of the progress of the mineral industry in California for the four years ending December, 1899 ---- ----
**Bulletin No. 21. Mineral Production of California by Counties, by Charles G. Yale. 1900. Tabulated sheet ---- ----
**Bulletin No. 22. Mineral Production of California for Fourteen Years, by Charles G. Yale. 1900. Tabulated sheet ---- ----
Bulletin No. 23. The Copper Resources of California, by P. C. DuBois, F. M. Anderson, J. H. Tibbits and G. A. Tweedy. 1902, 282 pp., 69 illustrations, and 9 maps ---- .50

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**Bulletin No. 25. Mineral Production of California, by Counties, for 1901, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 26. Mineral Production of California for the past Fifteen Years, by Charles G. Yale. 1902. Tabulated sheet ----

**Bulletin No. 27. The Quicksilver Resources of California, by William Forstner. 1903. 273 pp., 144 illustrations, 8 maps ----

**Bulletin No. 28. Mineral Production of California, for 1902, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 29. Mineral Production of California for Sixteen Years, by Charles G. Yale. 1903. Tabulated sheet ----

**Bulletin No. 30. Bibliography Relating to the Geology, Palæontology, and Mineral Resources of California, by A. W. Vogdes. 1903. 290 pp. ----

**Bulletin No. 31. Chemical Analyses of California Petroleum, by H. N. Cooper. 1904. Tabulated sheet ----

**Bulletin No. 32. Production and Use of Petroleum in California, by Paul W. Prutzman. 1904. 230 pp., 116 illustrations, 14 maps ----

**Bulletin No. 33. Mineral Production of California, by Counties, for 1903, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 34. Mineral Production of California for Seventeen Years, by Charles G. Yale. 1904. Tabulated sheet ----

**Bulletin No. 35. Mines and Minerals of California, by Charles G. Yale. 1904. 55 pp., 20 county maps. Relief map of California ----

**Bulletin No. 36. Gold Dredging in California, by J. E. Doolittle. 1905. 120 pp., 66 illustrations, 3 maps ----

**Bulletin No. 37. Gems, Jewelers' Materials, and Ornamental Stones of California, by George F. Kunz. 1905. 168 pp., 54 illustrations ----

**Bulletin No. 38. Structural and Industrial Materials of California, by Wm. Forstner, T. C. Hopkins, C. Naramore and L. H. Eddy. 1906. 412 pp., 150 illustrations, 1 map ----

**Bulletin No. 39. Mineral Production of California, by Counties, for 1904, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 40. Mineral Production of California for Eighteen Years, by Charles G. Yale. 1905. Tabulated sheet ----

**Bulletin No. 41. Mines and Minerals of California, for 1904, by Charles G. Yale. 1905. 54 pp., 20 county maps ----

**Bulletin No. 42. Mineral Production of California, by Counties, 1905, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 43. Mineral Production of California for Nineteen Years, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 44. California Mines and Minerals for 1905, by Charles G. Yale. 1907. 31 pp., 20 county maps ----

**Bulletin No. 45. Auriferous Black Sands of California, by J. A. Edman. 1907. 10 pp. ----

Bulletin No. 46. General Index of Publications of the California State Mining Bureau, by Charles G. Yale. 1907. 54 pp. $0.30

**Bulletin No. 47. Mineral Production of California, by Counties, 1906, by Charles G. Yale. Tabulated sheet ----

**Bulletin No. 48. Mineral Production of California for Twenty Years. 1906, by Charles G. Yale ----

**Bulletin No. 49. Mines and Minerals of California for 1906, by Charles G. Yale. 34 pp. ----

Bulletin No. 50. The Copper Resources of California, 1908, by A. Hausmann, J. Kruttschnitt, Jr., W. E. Thorne and J. A. Edman, 366 pp., 74 illustrations. (Revised edition.) 1.00

**Bulletin No. 51. Mineral Production of California, by Counties, 1907, by D. H. Walker. Tabulated sheet ----

**Bulletin No. 52. Mineral Production of California for Twenty-one Years, 1907, by D. H. Walker. Tabulated sheet ----

**Bulletin No. 53. Mineral Production of California for 1907, with County Maps, by D. H. Walker, 62 pp. ----

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**Bulletin No. 54. Mineral Production of California, by Counties, by D. H. Walker, 1908. Tabulated sheet ----

**Bulletin No. 55. Mineral Production of California for Twenty-two Years, by D. H. Walker, 1908. Tabulated sheet ----

**Bulletin No. 56. Mineral Production for 1908, with County Maps and Mining Laws of California, by D. H. Walker. 78 pp. ----

**Bulletin No. 57. Gold Dredging in California, by W. B. Winston and Chas. Janin. 1910, 312 pp., 239 illustrations and 10 maps ----

**Bulletin No. 58. Mineral Production of California, by Counties, by D. H. Walker, 1909. Tabulated sheet ----

**Bulletin No. 59. Mineral Production of California for Twenty-three Years, by D. H. Walker, 1909. Tabulated sheet ----

**Bulletin No. 60. Mineral Production for 1909, County Maps and Mining Laws of California, by D. H. Walker. 94 pp. ----

**Bulletin No. 61. Mineral Production of California, by Counties for 1910, by D. H. Walker. Tabulated sheet ----

**Bulletin No. 62. Mineral Production of California for Twenty-four Years, by D. H. Walker, 1910. Tabulated sheet ----

**Bulletin No. 63. Petroleum in Southern California, by P. W. Prutzman, 1912, 430 pp., 41 illustrations, 6 maps ----

**Bulletin No. 64. Mineral Production for 1911, by E. S. Boalich. 49 pp. ----

**Bulletin No. 65. Mineral Production for 1912, by E. S. Boalich. 64 pp. ----

**Bulletin No. 66. Mining Laws of the United States and California. 1914, 89 pp. ----

**Bulletin No. 67. Minerals of California, by Arthur S. Eakle. 1914, 226 pp. ----

**Bulletin No. 68. Mineral Production for 1913, with County Maps and Mining Laws, by E. S. Boalich. 160 pp. ----

**Bulletin No. 69. Petroleum Industry of California, with Folio of Maps (18 by 22), by R. P. McLaughlin and C. A. Waring. 1914, 519 pp., 13 illustrations, 83 figs. [18 plates in accompanying folio.] ----

**Bulletin No. 70. Mineral Production for 1914, with County Maps and Mining Laws. 184 pp. ----

**Bulletin No. 71. Mineral Production for 1915, with County Maps and Mining Laws, by Walter W. Bradley. 193 pp., 4 illustrations ----

Bulletin No. 72. The Geologic Formations of California, by James Perrin Smith. 1916, 47 pp. $0.25

**Reconnaissance Geologic Map (of which Bulletin 72 is explanatory), in 23 colors. Scale: 1 inch = 12 miles. Mounted ----

**Bulletin No. 73. First Annual Report of the State Oil and Gas Supervisor of California, for the fiscal year 1915–16, by R. P. McLaughlin. 278 pp., 26 illustrations ----

Bulletin No. 74. Mineral Production of California in 1916, with County Maps, by Walter W. Bradley. 179 pp., 12 illustrations Free

**Bulletin No. 75. United States and California Mining Laws, 1917. 115 pp., paper ----

Bulletin No. 76. Manganese and Chromium in California, by Walter W. Bradley, Emile Huguenin, C. A. Logan, W. B. Tucker and C. A. Waring. 1918. 248 pp., 51 illustrations, 5 maps, paper .50

Bulletin No. 77. Catalogue of Publications of California State Mining Bureau, 1880–1917, by E. S. Boalich. 44 pp., paper Free

Bulletin No. 78. Quicksilver Resources of California, with a Section on Metallurgy and Ore-Dressing, by Walter W. Bradley, 1918. 389 pp., 77 photographs and 42 plates (colored and line cuts), cloth 1.50

Bulletin No. 79. Magnesite in California, by Walter W. Bradley, 1925, 147 pp., 62 photographs, 11 line cuts and maps, cloth 1.00

†Bulletin No. 80. Tungsten, Molybdenum and Vanadium in California. (In preparation.)

†Bulletin No. 81. Foothill Copper Belt of California. (In preparation)

† Not yet published.

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**Bulletin No. 82. Second Annual Report of the State Oil and Gas Supervisor, for the fiscal year 1916–1917, by R. P. McLaughlin, 1918. 412 pp., 31 illustrations, cloth ----

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**Bulletin No. 84. Third Annual Report of the State Oil and Gas Supervisor, for the fiscal year 1917–1918, by R. P. McLaughlin, 1918. 617 pp., 28 illustrations, cloth ----

**Bulletin No. 85. Platinum and Allied Metals in California, by C. A. Logan, 1919. 10 photographs, 4 plates, 120 pp., paper ----

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**Bulletin No. 87. Commercial Minerals of California, with notes on their uses, distribution, properties, ores, field tests, and preparation for market, by W. O. Castello, 1920. 124 pp., paper ----

Bulletin No. 88. California Mineral Production for 1919, with County Maps, by Walter W. Bradley, 1920. 204 pp., paper Free

**Bulletin No. 89. Petroleum Resources of California, with Special Reference to Unproved Areas, by Lawrence Vander Leck, 1921. 12 figures, 6 photographs, 6 maps in pocket, 186 pp., cloth ----

Bulletin No. 90. California Mineral Production for 1920, with County Maps, by Walter W. Bradley, 1921. 218 pp., paper Free

Bulletin No. 91. Minerals of California, by Arthur S. Eakle, 1923, 328 pp., cloth $1.00

Bulletin No. 92. Gold Placers of California, by Chas. S. Haley, 1923. 167 pp., 36 photographs and 7 plates (colored and line cuts, also geologic map), cloth 1.50

Extra copies of the Geologic Map (in 4 colors) .50

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Bulletin No. 94. California Mineral Production for 1923, by Walter W. Bradley, 1924. 162 pp., paper Free

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**Bulletin No. 96. California Mineral Production for 1924, by Walter W. Bradley, 1925. 173 pp., paper ----

**Bulletin No. 97. California Mineral Production for 1925, by Walter W. Bradley, 1926. 172 pp., paper ----

Bulletin No. 99. Clay Resources and Ceramic Industry of California by Waldemar Fenn Dietrich, 1928. 383 pp., 70 photos, 12 line cuts including maps, cloth 1.50

**Bulletin No. 100. California Mineral Production for 1926, by Walter W. Bradley, 1927. 174 pp., paper ----

PRELIMINARY REPORTS

Asterisks (**) indicate the publication is out of print.

**Preliminary Report No. 1. Notes on Damage by Water in California Oil Fields, December, 1913. By R. P. McLaughlin. 4 pp. ----

**Preliminary Report No. 2. Notes on Damage by Water in California Oil Fields, March, 1914. By R. P. McLaughlin. 4 pp. ----

Preliminary Report No. 3. Manganese and Chromium, 1917. By E. S. Boalich. 32 pp. Free

Preliminary Report No. 4. Tungsten, Molybdenum and Vanadium. By E. S. Boalich and W. O. Castello, 1918. 34 pp. Paper Free

Preliminary Report No. 5. Antimony, Graphite, Nickel, Potash, Strontium and Tin. By E. S. Boalich and W. O. Castello, 1918. 44 pp. Paper Free

**Preliminary Report No. 6. A Review of Mining in California During 1919. Fletcher Hamilton, 1920. 43 pp. Paper ----

**Preliminary Report No. 7. The Clay Industry in California. By E. S. Boalich, W. O. Castello, E. Huguenin, C. A. Logan, and W. B. Tucker, 1920. 102 pp. 24 illustrations. Paper ----

**Preliminary Report No. 8. A Review of Mining in California During 1921, with Notes on the Outlook for 1922. Fletcher Hamilton, 1922. 68 pp. Paper ----

MISCELLANEOUS PUBLICATIONS

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**First Annual Catalogue of the State Museum of California, being the collection made by the State Mining Bureau during the year ending April 16, 1881. 350 pp. ----

**Catalogue of books, maps, lithographs, photographs, etc., in the library of the State Mining Bureau at San Francisco, May 15, 1884. 19 pp. ----

**Catalogue of the State Museum of California, Volume II, being the collection made by the State Mining Bureau from April 16, 1881, to May 5, 1884. 220 pp. ----

**Catalogue of the State Museum of California, Volume III, being the collection made by the State Mining Bureau from May 15, 1884, to March 31, 1887. 195 pp. ----

**Catalogue of the State Museum of California, Volume IV, being the collection made by the State Mining Bureau from March 30, 1887, to August 20, 1890. 261 pp. ----

**Catalogue of the Library of the California State Mining Bureau, September 1, 1892. 149 pp. ----

**Catalogue of West North American and Many Foreign Shells with Their Geographical Ranges, by J. G. Cooper. Printed for the State Mining Bureau, April, 1894 ----

**Report of the Board of Trustees for the four years ending September, 1900. 15 pp. Paper ----

Bulletin. Reconnaissance of the Colorado Desert Mining District. By Stephen Bowers, 1901. 19 pp. 2 illustrations. Paper Free

Commercial Mineral Notes. A monthly mimeographed sheet, beginning April, 1923 Free

MAPS

Register of Mines With Maps.

Asterisks (**) indicate the publication is out of print.

**Register of Mines, with Map, Amador County ----

**Register of Mines, with Map, Butte County ----

**Register of Mines, with Map, Calaveras County ----

**Register of Mines, with Map, El Dorado County ----

**Register of Mines, with Map, Inyo County ----

**Register of Mines, with Map, Kern County ----

**Register of Mines, with Map, Lake County ----

**Register of Mines, with Map, Mariposa County ----

**Register of Mines, with Map, Nevada County ----

**Register of Mines, with Map, Placer County ----

**Register of Mines, with Map, Plumas County ----

**Register of Mines, with Map, San Bernardino County ----

**Register of Mines, with Map, San Diego County ----

Register of Mines, with Map, Santa Barbara County (1906) $0.25

**Register of Mines, with Map, Shasta County ----

**Register of Mines, with Map, Sierra County ----

**Register of Mines, with Map, Siskiyou County ----

**Register of Mines, with Map, Trinity County ----

**Register of Mines, with Map, Tuolumne County ----

Register of Mines, with Map, Yuba County (1905) .25

Register of Oil Wells, with Map, Los Angeles City (1906) .35

OTHER MAPS

Asterisks (**) indicate the publication is out of print.

**Map of California, Showing Mineral Deposits (50 x 60 in.) ----

**Map of Forest Reserves in California ----

**Mineral and Relief Map of California ----

**Map of El Dorado County, Showing Boundaries, National Forests ----

**Map of Madera County, Showing Boundaries, National Forests ----

**Map of Placer County, Showing Bonndaries, National Forests ----

**Map of Shasta County, Showing Boundaries, National Forests ----

**Map of Sierra County, Showing Boundaries, National Forests ----

**Map of Siskiyou County, Showing Boundaries, National Forests ----

**Map of Tuolumne County, Showing Boundaries, National Forests ----

OTHER MAPS—Continued

Asterisks (**) indicate the publication is out of print.	Price
**Map of Mother Lode Region	----
**Map of Desert Region of Southern California	----
Map of Minaret District, Madera County	.20
Map of Copper Deposits in California	.05
**Map of Calaveras County	----
**Map of Plumas County	----
**Map of Trinity County	----
**Map of Tuolumne County	----
Geological Map of Inyo County. Scale 1 inch equals 4 miles	$0.60
Map of California accompanying Bulletin No. 89, showing generalized classification of land with regard to oil possibilities. Map only, without Bulletin	.25
**Geological Map of California, 1916. Scale 1 inch equals 12 miles. As accurate and up-to-date as available data will permit as regards topography and geography. Shows railroads, highways, post offices and other towns. First geological map that has been available since 1892, and shows geology of entire state as no other map does. Geological details lithographed in 23 colors. Mounted	----
Topographic Map of Sierra Nevada Gold Belt, showing distribution of auriferous gravels, accompanying Bulletin No. 92 (also sold singly) In 4 colors	.50

OIL FIELD MAPS

These maps are revised from time to time as development work advances and ownerships change.

Map No. 1—Sargent, Santa Clara County	.50
Map No. 2—Santa Maria, including Cat Canyon and Los Alamos	.75
Map No. 3—Santa Maria, including Casmalia and Lompoc	.75
Map No. 4—Whittier-Fullerton, including Olinda, Brea Canyon, Puente Hills, East Coyote and Richfield	.75
Map No. 5—Whittier-Fullerton, including Whittier, West Coyote, and Montebello	.75
Map No. 6—Salt Lake, Los Angeles County	.75
Map No. 7—Sunset and San Emido and Kern County	.75
Map No. 8—South Midway and Buena Vista Hills, Kern County	.75
Map No. 9—North Midway and McKittrick, Kern County	.75
Map No. 10—Belridge and McKittrick, Kern County	.75
Map No. 11—Lost Hills and North Belridge, Kern County	.75
Map No. 12—Devils Den, Kern County	.75
Map No. 13—Kern River, Kern County	.75
Map No. 14—Coalinga, Fresno County	1.00
Map No. 15—Elk Hills, Kern County	.75
Map No. 16—Ventura-Ojai, Ventura County	.75
Map No. 17—Santa Paula-Sespe Oil Fields, Ventura County	.75
Map No. 18—Piru-Simi-Newhall Oil Fields	.75
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Map No. 33—Rincon, Ventura County	.75

DETERMINATION OF MINERAL SAMPLES

Samples (limited to three at one time) of any mineral found in the state may be sent to the Division of Mines and Mining for identification, and the same will be classified free of charge. No samples will be determined if received from points outside the state. It must be understood that no assays, or quantitative determinations will be made. Samples should be in lump form if possible, and marked plainly with name of sender on outside of package, etc. No samples will be received unless delivery charges are prepaid. A letter should accompany sample, giving locality where mineral was found and the nature of the information desired.

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